JANUARY 22, 1955

Vol. 148—No. 4

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING •

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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FLASHES AND PLUGS

HERE! HERE! Whenever the telephone of a Pacific Beach, Cal., man rang, the air raid siren across the street screeched. As soon as he picked up the receiver, the siren stopped.

This harassed gentleman figured his right to privacy was being invaded. The whole neighborhood knew whenever his telephone rang. The neighbors also were annoyed. Twenty of them called the police department.

Shortly the telephone company rushed a repair crew to the scene to get the wires uncrossed.

• • •

POTABLE SET? A citizen of Bradrick, O., was spotted by a police cruiser recently walking uncertainly down one of the city's busiest streets. He was carrying a telephone in one hand.

Officers stopped and questioned the man, who explained that his wife had objected to his going out to celebrate the New Year and had threatened to telephone police if he did.

This didn't stop him, however. He disconnected the telephone and took it with him.

He was booked on a drunkenness charge.

• • •

REVERSE ENGLISH. The Southwestern Bell *Telephone News* recently carried the following bit of whimsy:

A Lancaster, Mo., customer asked the operator if she wanted the number of the party he was calling long distance.

The operator, of course, said, "Yes, please."

The customer passed the number with the quip, "Now make a note of it, operator, so you won't have to ask me for it again."

• • •

PREMATURE EVIDENCE. Since announcement was made in Waycross, Ga., that the city water would be fluoridated, officials have received several calls about dead goldfish and the like from those protesting against the strength of the chemical.

There's just one hitch to the argument: The officials haven't added a spoonful of the stuff yet.

• • •

HIS MASTER'S VOICE. A columnist in Atlanta, Ga., tells the story about a boxer dog named Butch. It seems that Butch belongs to a man and his wife who, every day before they set out for their respective jobs, take him to a sister's house several doors up the street.

Butch stays there contentedly enough all day, but when his owners get home they call the sister and ask her to put Butch's ear to the telephone. "Come home, Butch," commands the shiny black thing, and almost before the telephone at home is cradled again, Butch is there.

CIRCULATION

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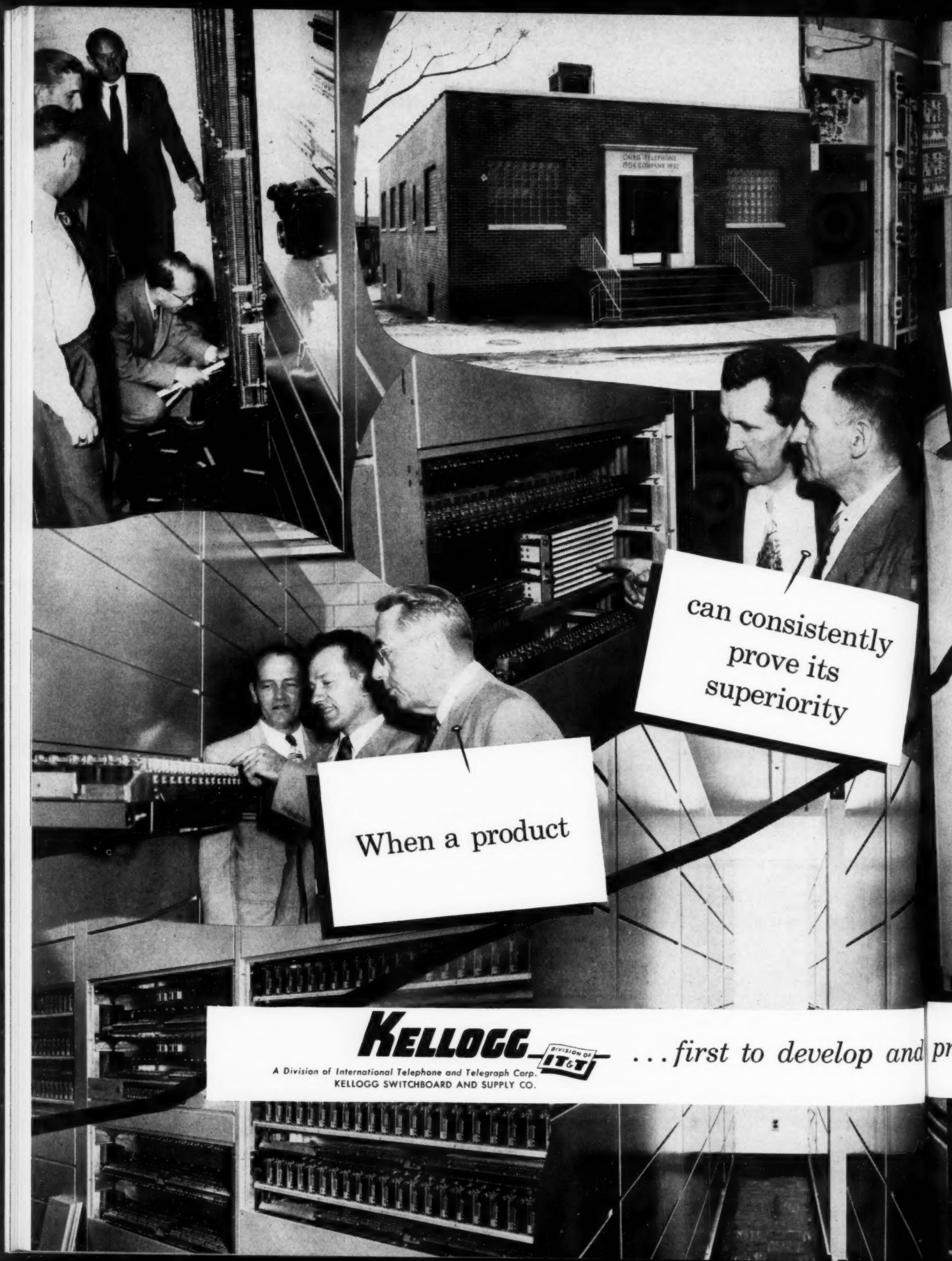

KELLOGG DIVISION OF IT&T ... first to develop and pr

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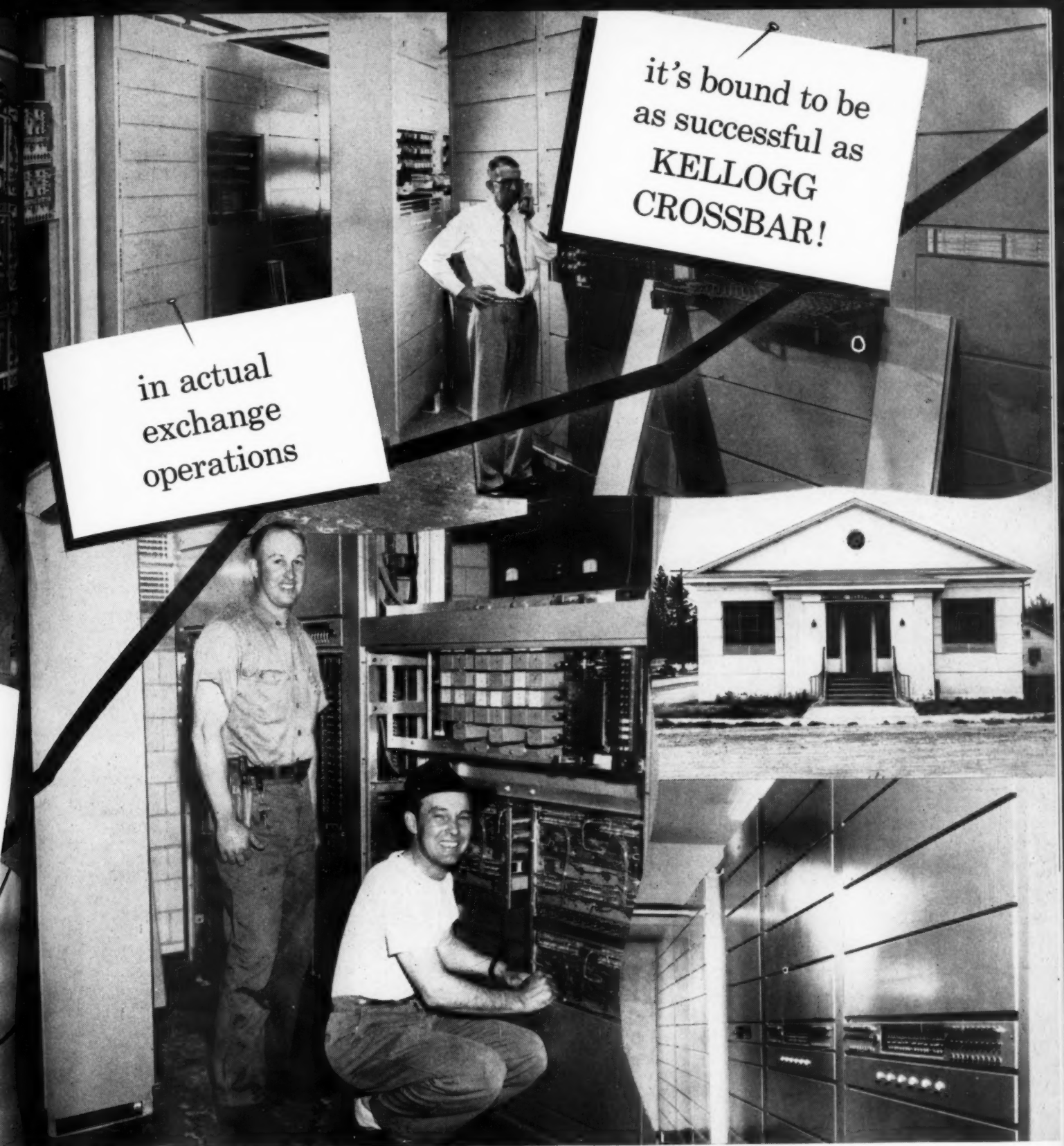

nd produce CROSSBAR for the Independent Telephone Industry

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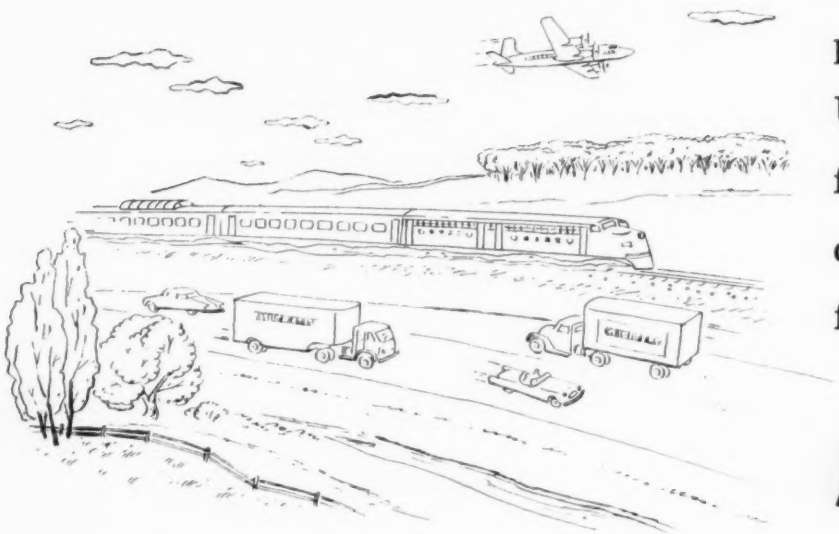

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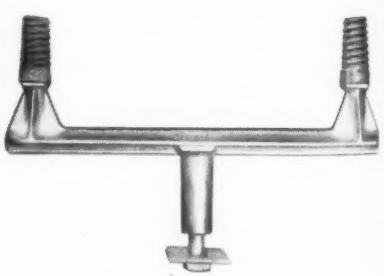

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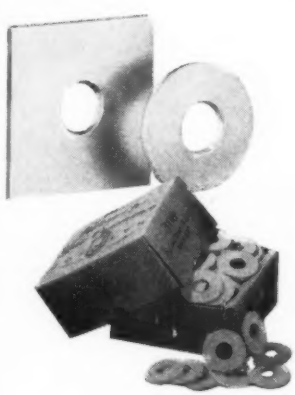
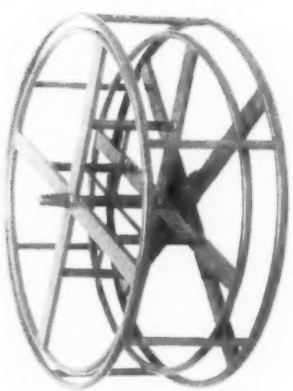
Long Service Life and Low Plant Costs go hand-in-hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in both Copperweld and Bronze. This flexible and easy to handle wire is made by GENERAL INSULATED WIRE WORKS, INC.

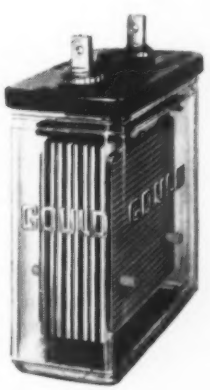
for Line Supplies



Complete Line of Hardware to meet all outside telephone plant requirements. Joslyn's convenient package of small hardware — like the round washers shown above—promotes better "housekeeping" in the storeroom and on the line truck. JOSLYN.



Squirrel Cage Payout Reel No. 700 is built to pay out stiff and stubborn wire. Mounts vertically in or on service trucks or used horizontally any place. Stationary or adjustable pins available for various inside diameters of coils. Made by NEAL COMPANY.



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WHY SHOULD A CORDLESS PBX BE SO CLUMSY?
LET'S MAKE IT MUCH EASIER TO OPERATE!
WHY NOT HAVE KEYS THAT OPERATE ONLY ONE WAY?
WHY — IT COULD LOOK LIKE A MODERN BUSINESS MACHINE!
I THINK WE CAN MAKE A CORDLESS BOARD THAT WILL BE MUCH LIGHTER!

. . . and HERE YOU

Here indeed, in this beautiful Leich Cordless, is the new look in PBX Switchboards.

Only 7½ inches high and 16 inches long, this Leich Cordless gives you 20 lines, 5 trunks and 5 connecting circuits. It looks like a modern business machine and fits in very nicely in modern offices.

Operation is made easier by the new Leich one-way colored keys. Even girls who never worked a switchboard before can learn to give fast, efficient service with this unique new arrangement. It provides every modern operating feature.

This new Leich Cordless is designed to give you more dependable performance too. The new, positive-action keys are extremely simple in design and operation. The new Leich built-in multiple eliminates 52 per cent of the contacts and 64 per cent of the soldered joints that were necessary on old style Cordless boards.

Find out right now how you can use the new Leich Cordless to build business revenue in your company. Write today for catalog and prices.

LEICH

JARE !

Removing cover makes all the parts instantly accessible. No crowded maze of wires. There's less to go wrong on this new Leich Cordless. All parts are made of the highest grade materials. Precious metal contact surfaces are used on all the keys.

the most practical, easy-to-use Cordless Switchboard you've ever seen.

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SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEXAS PACIFIC COAST: 2611 SAWTELLE BLVD., LOS ANGELES 64, CALIF.

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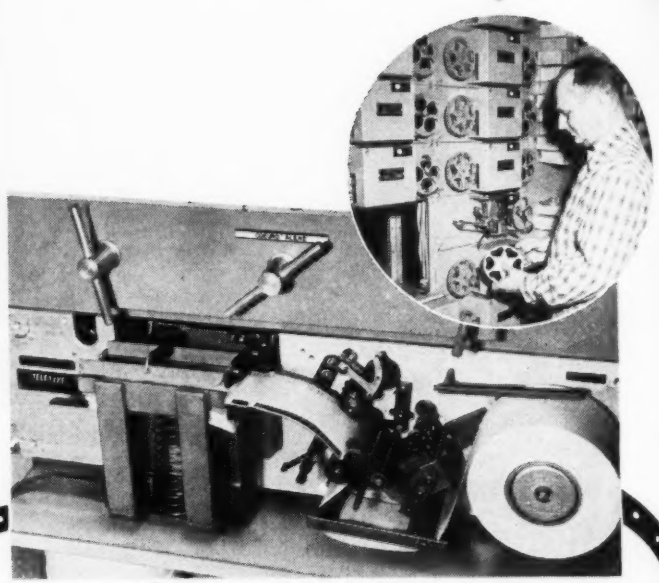
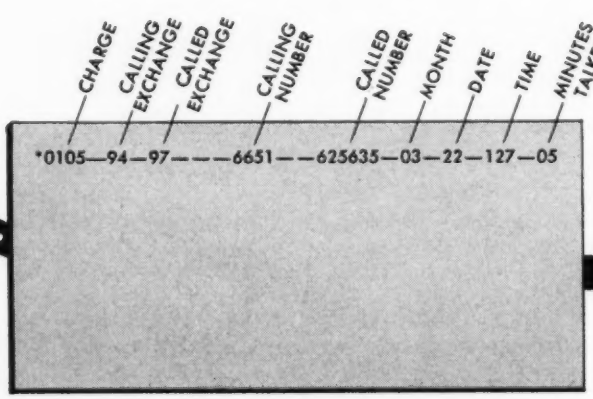
Every Short-Haul Toll Cal"

NORTH ANALYZER: "Reads" the punched record —computes the cost from preset base and overtime rates.

A full reel of recorded tape is removed from a bank of recorders illustrated below.



The "Teletype" printer in the analyzer unit prints the information and cuts the tickets to standard size.



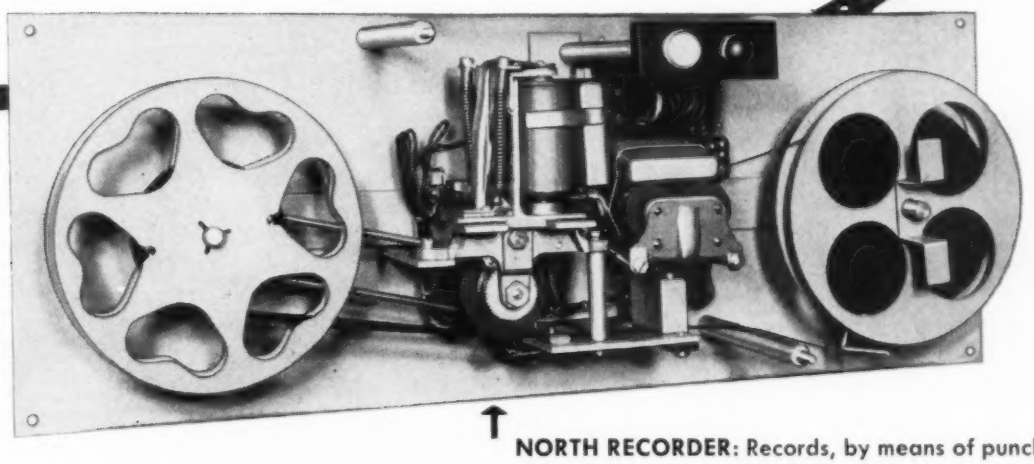
SAMPLE PRINTED TICKET

NORTH

"Writes Its Own Ticket"

When the cost of handling short-haul toll calls starts absorbing your potential profits, it's time to investigate the advantages of equipping your automatic exchange with North Autollizer. The steady night and day flow of unsupervised toll business is sure to win your highest approval.

Proved by performance the Autollizer will handle direct dialed toll calls in any automatic exchange at a profit. Let us show you the case histories of actual independent installations where North Autollizer has "proved-in" at a profitably short time.



NORTH RECORDER: Records, by means of punching on a tape, all the information necessary for billing of short-haul toll calls.

NORTH AuTollizer

Toll Ticketing that Pays its Way

Available in Canada through ERICSSON TELEPHONE SALES of CANADA, Ltd. 1410 Stanley Street Montreal 2, P.Q.

THE NORTH ELECTRIC MANUFACTURING COMPANY

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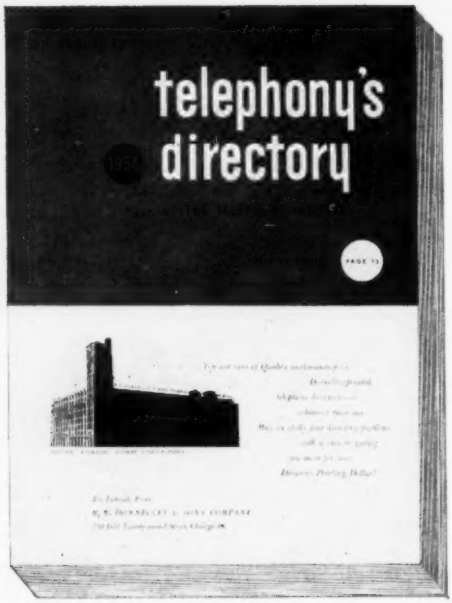

Announcing . . .

The 60th Annual Edition of TELEPHONY'S Directory of the Telephone Industry

Those in the Operating end of the business make great use of this valuable reference book as a buyer's guide . . . the Classified Products Index and the Manufacturers' Index, supplemented by the advertisements of over 200 concerns. They also consult the other major sections such as (1) Telephone Law and Commission Regulation, (2) Statistical Section, (3) Associations and Commissions. One of the most useful sections is the List of Independent Telephone companies (5,888 in 1954 edition) which is referred to by operating companies in settling toll billings.

Those in the Manufacturing and Supply end of the business use the Directory for contacting all telephone companies in their respective areas by direct mail, by personal calls or by telephone. This valuable book contains the information that enables them to do this without any waste of time or delay.

The work of compiling the 60th edition of

TELEPHONY'S Directory
of the
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DELIVERY WILL BE MADE ON OR ABOUT MAY 15.

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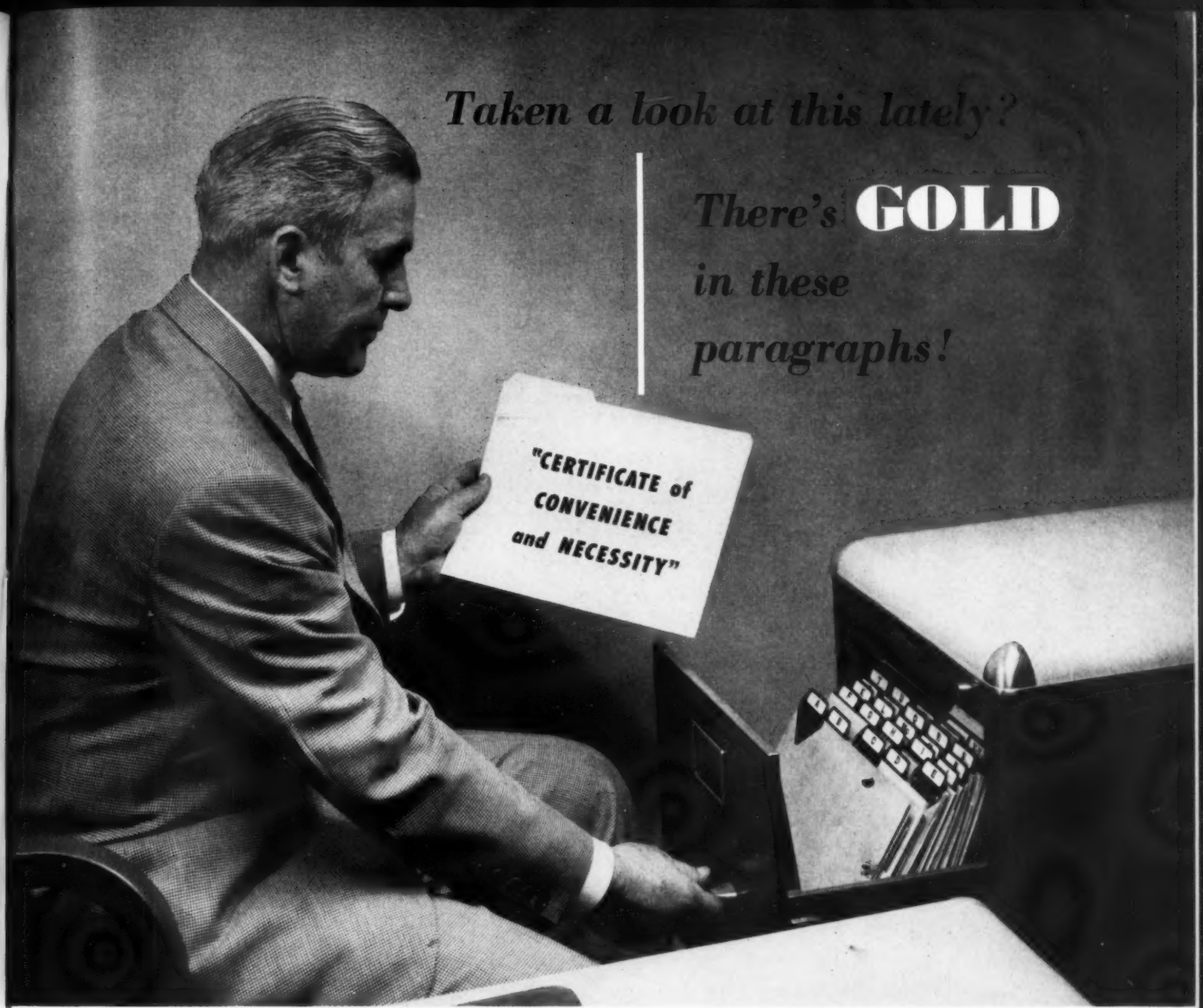

The very title of the franchise under which you operate contains a gentle nudge to your commercial department . . .

"necessity" . . . keeps you in business supplying the basic twenty-four-hours-a-day facilities of telephony.

"convenience" . . . points to all the extra services you can render to merit and profit by extra *revenue.*

Take a look with us—through the next three pages —at some products which, with just a little "push," can start your monthly income upward.

Turn page for revenue-boosters

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TAKE ADVANTAGE OF "CONVENIENCE"

Stromberg-Carlson Multi-line Systems

The "1573" Two-line Telephone

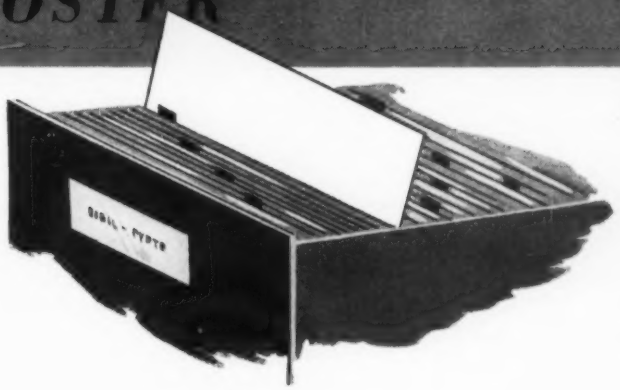
For the executive-and-secretary combination in a small office . . . for the retail store with several telephones, each accepting orders . . . for private internal service linked to a manual PBX for central office connections . . . here's the ideal system. Each "1573" provides two trunk lines with holding, plus a local line for intercom service. Tell your subscribers—"Here's a miniature PBX to put right on your desk!"

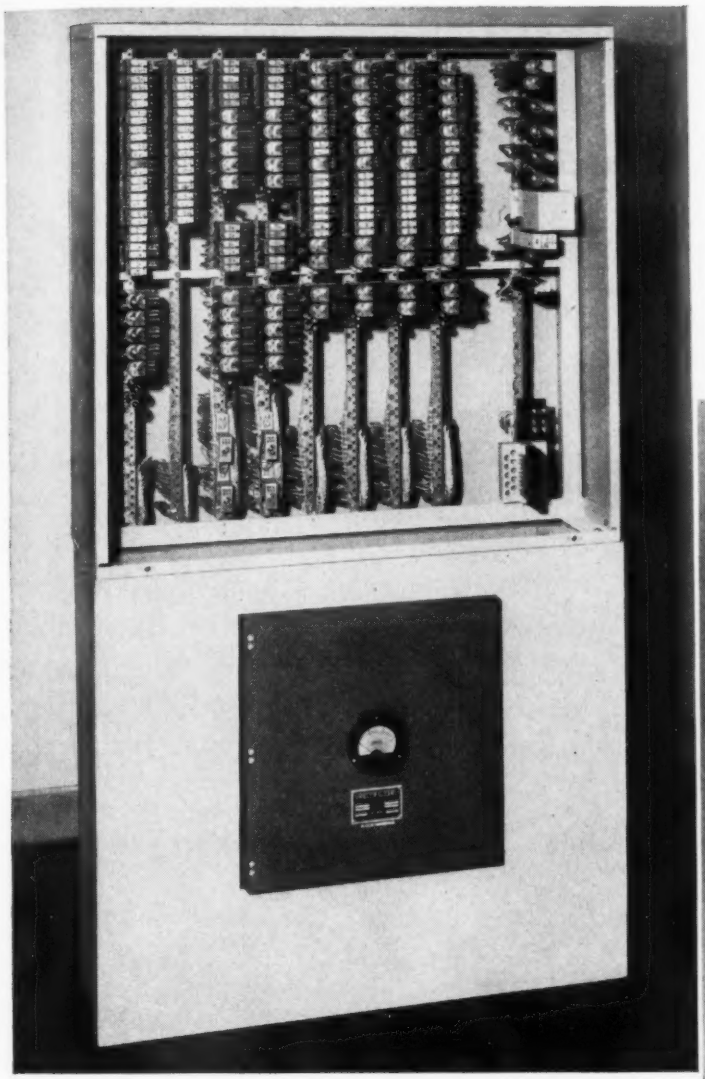
The "6K" Telephone System

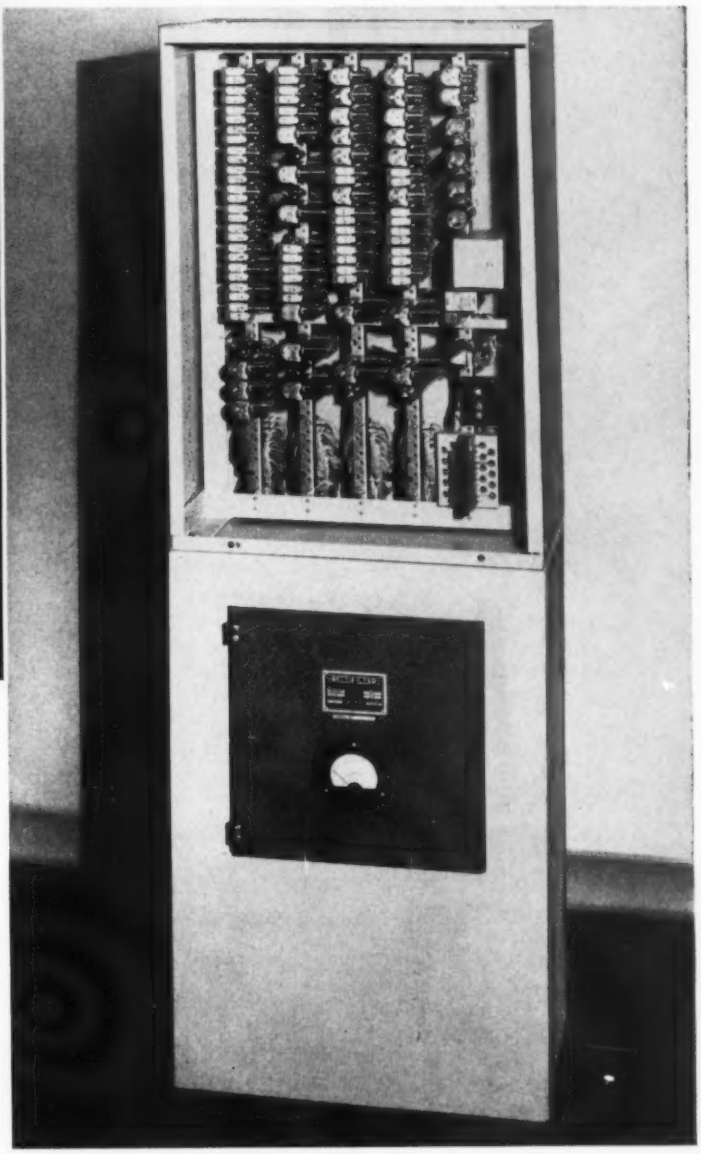
With this ingenious instrument, plus a relay cabinet, a terminal box and a simple power pack, you give a subscriber the last word in shared-line service. The 6 buttons may be used in a wide variety of combinations—to perform functions of Line, Hold, Intercom, Signal or to be reserved for future use. Visual signals are provided. And, like all "1500" series equipment, the instrument itself is utterly modern in appearance.

Stromberg-Carlson® *Factory, General Offices at R*

...IT'S A REVENUE-BOOSTER







Dial PBX Systems

The "1573" and the "6K" equipment shown on the opposite page make up a dial PBX when combined with either the "2-10" or the "4-20" system. Differing only in capacity (two simultaneous talking paths for up to 30 telephones or four paths for up to 60), each system makes possible fully selective, private-conversation internal calls. Modern offices and plants will welcome this service—and gladly add to *your* revenue while they use it! Complete details of any or all of these systems available on request.

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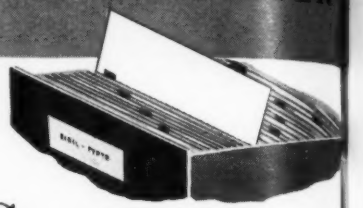
TAKE ADVANTAGE OF "CONVENIENCE"... IT'S A REVENUE-BOOSTER



Stromberg-Carlson Internal Systems

"1270" Series Convenience Systems

Architects, banks, clubs, dental centers, employment agencies—you can find in the whole A-to-Z range of smaller establishments likely prospects for these long-favored systems. Requiring no attendant, they provide both trunk and intercom service, 24 hours a day. Common talking, selective ringing and optional secret service are available. The systems offer either 2 or 3 trunks and line capacity up to 10 stations.

Multiple Line Key Turrets

Here's the backbone of multi-line services, specially recommended for the type of office or industry where "Order Board" facilities are needed, but economy of both space and cost is important. Made in multiples of 3's, Stromberg-Carlson turrets offer up to 9 lines, with keys that furnish Answer, Originate and Hold functions on each line and visual lamp indications. They will save your subscriber's time and nerves and help him never to lose an order because of inefficient telephone distribution. And they'll make *you* extra revenue.

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by FRANCIS X. WELCH WASHINGTON EDITOR

British Post Office finds setting aside annual depreciation of its telephone plant on original cost of equipment at prewar prices is an accountant's illusion of accuracy. . . . Realizes it has nothing to do with responsibilities of practical management. . . . American regulatory authorities might take to heart the realistic accounting practices of the British.

OVER IN Great Britain where the Post Office Department runs the telephone business (and has since 1911) there is still a "waiting list" for telephones. As of March, 1954, this list was still 376,000, which is slightly more than 6 per cent of Great Britain's estimated 6 million telephones in service. The British Post Office has had the same postwar problem as telephone companies in the United States in keeping up with the demand. It has never been below the 300,000 mark despite a doubling of the number of telephones in the country since the war.

But there are other very interesting aspects and valuable lessons for telephone companies and regulators in the United States to be found in British Post Office telephone practice. There was a brief but revealing analysis along this line in the Dec. 11, 1954, issue of *The Economist*.

One of the policy lessons which American regulators as well as legislators might take to heart is the realistic accounting practices of the British Post Office. The British Post Office is just like our own Post Office and the Tennessee Valley Authority, a government department engaged in a business enterprise. It pays no taxes—neither income tax, profits tax, nor even vehicle license tax. It draws its capital from the Treasury and hands its profits back to the Treasury. Even its accumulated depreciation is simply a bookkeeping statement, carried as a liability of the Royal Exchequer.

But the British, as far back as 1912, realized the danger as well as the foolishness of trying to kid the taxpayer by juggling the books to show a synthetic profit where none existed. Such subterfuge leads to ever-increasing complacency and "rat-hole" appropriation habits. And so the Post Office established what is known as "Commercial Accounts," dating from 1912, to show what the balance sheet and profit and loss account would look like if a normal accounting system were in use, and if the department had to pay Public Works Loans Board's long-term rates on its capital, and if it charged other departments of the government a regular commercial rate for service rendered.

Even so, *The Economist* finds the Post Office's "Commercial Accounts" more reassuring on the surface than convincing underneath. *The Economist* comments on these "Commercial Accounts" as follows:

". . . Certainly there has been no attempt to imitate America to the slavish extent of running postal services at an enormous loss (though telephones are a thriving commercial business). The Post Office has shared in the prosperity of the country and a modest, but modestly growing, profit is handed over, which must go far to make up for the tax immunity enjoyed. The figure for the latest year was £7.4 million compared with £4.9 million in the previous year. That profit will be needed, since the recent wage concessions to rank and file grades and the relevant pension liability alone will cost £7 million a year with an unknown addition for other civil servants in the Post Office. But on the surface the Post Office is not, so far, 'in the red.' Its surplus is a modest 2.7 per cent of income. The table shows that the Telephone Account with a surplus of £5.5 million against £3.7 million was this time the biggest contributor to the total."

The original cost investment (undepreciated) to the British Post Office service was carried on the books as of Mar. 31, 1954, at £514 million. At the current rate of exchange ($2.80), this would work out at about 1.4 billion dollars. But it would be misleading to attempt to try to get the average investment per station in dollars, on a comparable basis with the United States average for a number of reasons. Not only is there the wide variation in the foreign exchange (the pound has been devalued from $4.90 to $2.80 since the war), but there is a difference between British and American practice as to the number of telephones in relation to the number of so-called "connections," of which there were only 3.8 million in Great Britain.

Realistic Depreciation

The real catch in the Auditor General's report, however, according to *The Economist*, lies in the depreciation factor. A good many of our American state public service commissions and all of our Federal regulatory commissions still rigidly adhere to "straight-line" original cost depreciation. In fact, some of them view any other practice as reactionary, or "discredited" if not something less than honest. But the British Post Office, very soon after the war, realized that setting aside annual depreciation on the basis of the original cost of equipment purchased at prewar prices was simply an accountant's illusion of accuracy, which has nothing whatever to do with the responsibilities of practical management.

And so, starting in 1947 the Post Office began to sneak into its original cost depreciation accruals each year a little extra amount "towards meeting the heavy costs of renewal of plant which will have to be met in future years." In 1954 the addition was £1.5 million. This was 50 per cent more than the £1 million additional allowance used in 1953. But even so, *The Economist* finds that it is grossly inadequate. The observations on this point will cause many an American utility management official to grin up his sleeve, when he recalls all the pos-

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turing which some regulatory "authorities" have been indulging in, regarding the sanctity and orthodoxy of strict original cost depreciation practice:

"For seven years now the Post Office telephone account has been quietly tucking away small sums for additional depreciation. Leaders of progressive private industry will note that the civil servants who run the Post Office decided that depreciation allowances that only provided for the replacement of prewar assets at prewar prices, were nonsense and would, if continued, mean living on capital, about as soon as the industrialists themselves made the same discovery. The Treasury has allowed the Post Office to make this furtive concession to financial orthodoxy (sic!) for which the British tax system makes no provision, feeling no doubt that, like the illegitimate baby, it was only a little one. It was also a provision that cost the Treasury nothing whereas when private industry does it, it has to use money on which tax has been paid. Managements of the junior nationalized industries have also been given an example to study. The trouble is that this item cannot go on being a little one. The Post Office has established a principle, but it has not finished the job. . . ."

It was apparent from the Auditor General's report that both he and the British Treasury knew that a considerably larger provision was needed. The report refers to a Treasury statement in 1949 that "in order to arrive at a permanent solution of the problem a complete revaluation of plant and a reassessment of plant lives would be necessary." *The Economist* thought that it was evident from these words that the extra allowance of £1.5 million (on top of regular straight-line depreciation) was not enough to replace the physical assets at present cost as they wear out. Therefore, it was deduced that "public capital is being consumed faster than it is replaced." Hence, the conclusion by *The Economist* that "£7.4 million surplus is not, in strict logic, a profit at all; and the telephone service at its present price contains an element of subsidy."

After making various calculations of its own as to what the British telephone system needs "to draw from the public by way of charges and plough back in order to prevent erosion of its capital," *The Economist* comes up with the following conclusions:

". . . All in all, the extra sum which is needed cannot be very different from half the straight-line depreciation figure. It is a fair shot that the present allowance is in the region of £10 to £15 million a year too low. If it were proposed to make good the shortfalls of the past, the sum needed would be far more, but even a purist would hardly demand this."

This is based on a judgment figure as to the relative cost of telephone plant investment before and after the war, when the inflationary factor played such havoc.

British Rate Practice

It might be said, in passing, that the British Post Office seems to be making a nice profit on its first class mail, thereby carrying the burden of other non-remunerative activities and a telegraph service which is very definitely a losing proposition. The telegraph capital investment has been written down from £16.1 million to £9.6 million and is dismissed as "past hoping for."

But where is the British Post Office going to get the extra £10 to £15 million a year that would make the telephone service really self-supporting? The British telephone service just like our own American telephone service is a great consumer of capital. The strictly letter-carrying activity of the British Post Office is not such a comparative consumer of capital. Letter carrying is more of a current operating expense activity.

British telephone rates vary greatly. The spread is from £4 and 10 Shillings, for country residential party line, to £11 for urban business exclusive line. These are annual charges. But again caution must be exercised in trying to translate these charges into comparative American currency, not only because of the foreign exchange complications already noted, but because of British practice of making separate charges for rentals and outright sale of the telephone instrument. This particular rate structure dates from the early times when the Post Office set up an alternative form of service promotion which is apparently plaguing the system today.

But it is interesting to note the increases in the rates for British telephone rentals between 1938 and 1954. During that period residential rental rates have increased approximately 50 per cent, and business rates nearly 60 per cent. A comparison of American telephone rate increases over that same period would probably be something in the order of 25 per cent. And yet, over and above that, *The Economist* still thinks "an average increase approaching a third seems to be needed." This would amount to another 33 per cent increase over present rates, or well over 100 per cent increase of prewar British telephone rates.

All this would be needed not merely to show a profit but simply to get rid of subsidy and discrimination which has pervaded the nationalized British telephone service, in favor of unduly cheap residential service which includes most of the patrons (and voters). *The Economist* concluded on this point:

". . . It would be a reasonable policy for this nationalized industry not to aim at a high profit but to raise its prices until the element of subsidy disappeared. And to do so without much additional burden on industry, the gap between residential telephones and the more expensive business lines would have to be narrowed.

"Opinions may differ as to what would happen if that policy were adopted. It can be argued that demand is quite inelastic to price and would hardly be affected—a rather familiar argument from technicians in the na-

(Please turn to page 36)

Let's ALL Make Calling By Number Possible

Considering the wide use of operator toll dialing and with the telephone industry on the threshold of nationwide customer dialing, it is of paramount importance that as many toll-dialed telephone numbers as possible be known in advance or available upon a few seconds flip through one's number book or other repository.

Therefore, it came as a surprise when a division manager of a telephone industry manufacturer recently observed:

"At least 75 per cent of the telephone companies we receive correspondence from fail to list their own telephone numbers."

This executive went on to conclude: "It would certainly seem to me that if they are endeavoring to stress the importance of telephone numbers, they should start in their own back yard."

A justifiable and logical conclusion this seems to us—and it should apply not only to operating companies but to all manufacturers serving the industry—telephone numbers on letterheads, order forms, and in trade paper advertisements, or wherever else it is deemed worthwhile. Moreover, where there is both a business office and an executive department, or other frequently called division, numbers of each should be listed.

Our own industry should set the example.

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

ACCORDING to *Wood Preserving News*, the dependability of treated utility poles was again proved during the numerous lady hurricanes along the East Coast recently. A survey of the metropolitan New York and New Jersey coastal areas, where 60 mph winds and high tides prevailed, shows there was hardly any storm damage to poles or the extensive waterfront structures.

Pole breakage was almost non-existent. Most disruptions of communication and power lines were caused by falling trees which broke lines. One large New Jersey utility reported only two broken poles out of a gross plant of about 500,000.

One primary utility company serving Long Island, the eastern end of which bore the brunt of the storm, reported less than 100 poles down. About 60 of these were in the direct path of the storm which was so severe that a tidal wave washed across the narrow portion of the island, taking out sections of the line. Of the broken poles, 75 per cent were old untreated chestnut. One representative of this utility company stated, "The performance of treated poles in this storm was amazing."

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We are advised that several of the larger operating companies are now making good use of magnetic tape recorders to monitor their complaint desk. Not only does this recorder give them a complete record of the customer's complaint, but it also indicates how his complaints are handled by the telephone company's employes.

It is believed that this procedure should contribute much towards improved public relations of any operating telephone company.

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Many small companies are faced with the problem of rebuilding and extending their open wire rural lines. In most cases these companies have difficulties in hiring linemen who are experienced in climbing poles, stringing wire and doing similar work. When these qualified linemen are available they are usually employed at a much higher rate of pay than is available locally to labor.

Actually it requires very little training to qualify any good laborer in the job of assembling a cross-arm and placing it or wood brackets on a pole. Setting poles does not ordinarily present any problem and wire stringing is comparatively easy.

The only remaining problem is getting this man up a pole. This task is made easy by some small operating companies by the use of a simple ladder.

There have been many corny jokes in the telephone field, down through the years, about ladder linemen. That should not worry the small company, however, as these men are not linemen and would not know the ladder jokes.

At any rate, this method does get the job done at a reasonable cost so why worry about the linemen's tradition?

• • •

A 16-year-old boy in Atlanta, Ga., recently admitted to police that he had stolen over 50 telephones from schools, homes and business establishments.

It all started when a lineman friend gave this boy a receiver which he took apart to see how it worked. Soon he wanted a complete telephone to experiment with. He bought some parts from a wholesale dealer and built one telephone. Next he wanted a complete telephone system.

This time he went to the wrong place for his equipment. He broke into boarded-up homes of vacationers and pried out their telephones. Then he drew three of his high school classmates into his hobby—and into his thefts. They began a series of night burglaries of schools all over Atlanta, taking nothing but telephones and dimes they found in paystations. They used the equipment to rig up intricate communication systems. Parents of the boys said they didn't get worried because they assumed the equipment was being purchased from a wholesale house.

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Telephone solicitors are becoming a nuisance in some parts of the country. Hardly a day passes but what the Blain residence is called by someone selling dy-dee service, hospitalization and cemetery lots. Service from the cradle to the grave appears to be their object.

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It was certainly news to us when someone sent us a clipping from a West Coast newspaper that has the following to say with reference to future marvels to be expected in our communication systems:

"The laboratories are presently at work on a new 'brain' known as Audrey. This is the scientist's nickname for the automatic digit recognizer which will take over your dialing tasks.

"On some future day, when you step into a telephone booth, you will only have to sit down and speak the number you wish to call anywhere in the United States. Audrey, and the electronic marvels that back her up, will automatically get your party on the line, where you can see and hear your correspondent in a truly person-to-person conversation."

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When ground wires or conduits are attached to a pole with staples they sometimes work loose as a result of vibration. It is now claimed that this has been overcome by the use of a "Hold-Tite" staple that has barbed edges which grip and hold the wood firmly.

Actual tests indicate 67 per cent greater holding power than the same size conventional type staples. These staples are available in sizes from ⅞ inch to 1⅜ inches inside length.

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Transmission Design Considerations

By ***PAUL HENSON****

PLANNING for a nation-wide completely integrated inter-toll dial network has resulted in new concepts with respect to the transmission design of both toll and local plant. In considering the effect, on Independent telephone companies, of the new thinking on transmission standards, we must not lose sight of the necessity of improving service but without substantial loss of economy in design.

A general upgrading in present-day transmission standards has resulted not only because of inter-toll switching requirements, but also because of the general desire of the industry to bring telephone service up to the very highest state of the art and in keeping with the progress and improvement in other industries.

Transmission Objectives

In an effort to arrive at a reasonable grade or quality of transmission satisfactory to the majority of subscribers, the Bell System recently completed exhaustive tests which resulted in the establishment of transmission quality objectives. The tests disclosed that the modern transmission design program should look forward to meeting the following standards:

	*Desired Effective Loss**
Loss on 99+ percent of connections	+6 db or better
Loss on 95 percent of connections	+2 db or better
Loss on average connection	—4 db or better

*Effective loss is defined briefly as how much better (—db) or poorer (+db) the actual connection is than one involving two of the older type desk stands connected together in a specified manner, considering volume, sidetone, band width, and line and room noise.

This would mean that the maximum loss which would be encountered, except for a very few connections (less than 1 per cent), would be 6 db worse than "reference transmission." In order to obtain the desired distribution curve, 95 per cent of all connections could be but 2 db worse than reference and the average connection would necessarily need to be 4 db better than the reference.

It is doubtful if these optimum objectives can be attained in the very near future. These transmission standards represent a material improvement over today's plant performance. It is realized that they cannot be met over night but by careful design and planning, they can in time be attained in a practical and economical manner.

Reference Systems

Because of some general confusion that often arises in discussions involving transmission, a brief resume of the significance of the transmission reference system may prove helpful.

We can measure by relatively simple electrical instruments the efficiency of all of the various elements in a telephone circuit with the singular exception of the subscriber's telephone set. Inasmuch as acoustic energy is translated into electrical energy in the transmitter and the reverse translation takes place in the receiver, a direct electrical test of a telephone set's transmission efficiency cannot be readily made. It has, therefore, been necessary to use actual talking tests under laboratory conditions to get a useful rating of the transmission performance of the telephone instrument.

In order to rate the transmission efficiency of instruments and combinations of loops and sets in comparison to those of the *reference system*, talking tests are made using the instruments and loops to be rated and then comparing these results with like tests over the reference system. Adjustment is then made until transmission is judged to be equal over the reference system to that of the loop facility and telephone under measurement. The loss or gain of the loop and set under test as compared to the reference system is read directly in decibels.

If, when transmission is equalized, there is more artificial loss inserted in the system under test than in that of the reference system, the equipment under test is more efficient and is rated as having a negative loss. If, on the other hand, the reverse situation prevails, the instrument and loop under test is less efficient than the reference system and is given a "positive" (+db) rating.

Much confusion has apparently risen from this terminology. Some think of a positive (+) figure as a gain and a negative figure as a loss. The confusion can be avoided by keeping in mind that a positive figure indicates poorer transmission and a negative figure indicates better transmission than that of the reference system.

The subscribers' sets used in the reference system have characteristics similar to the desk stands which were in common use some 25 years ago. The need for a transmission rating system was recognized at that time and the instruments available were used to establish a reference level. As sub-

*Mr. Henson is assistant to the Chief Engineer of the Lincoln (Neb.) Telephone & Telegraph Co. and a member of the Sub-Committee on Transmission Testing and Inductive Interference of the United States Independent Telephone Association. He prepared this paper for the Plant Conference at the 1954 USITA convention.

scribers' instruments have been improved, negative numbers have begun to appear in transmission loop loss calculations. Today the rated losses of modern sets are so highly negative that often overall connections which have relatively low trunk losses are also negative.

Example of Loop Loss Calculation

Let us take a factual example which will indicate the overall *effective transmission* between two subscribers served from separate urban offices. Limiting or maximum loss loops are shown for the representative offices, viz:

Office	*Maximum Loop*	*Make-Up*	*Equivalent Loop*
1.—Lincoln "5" Office	19,800 feet	10,000 feet No. 22	
		9,800 feet No. 24	22,550 feet No. 22
2.—Lincoln '6" Office	16,800 feet	16,800 feet No. 22	16,800 feet No. 22
"5"—"6" Interoffice Trunk	23,500 feet	23,500 feet 19H88	23,500 feet 19H88

Assuming the most modern subscriber instruments in use at these locations, the effective transmission loss using exchange grade battery is shown by the manufacture's data sheets to be:

Loop	*Effective Transmission Loss*
(1) "5" Office—22,550 feet 22-Gauge	—4.8
Bridged, Taps, Junction Losses, Drop and Central Office Losses	+2.5
	—2.3
(2) "6" Office—16,800 feet 22-gauge	—7.4
Bridged Taps, Junction Losses, Drop and Central Office Losses	+2.5
	—4.9

The trunk loss for 23,500 feet of 19-gauge H88 loaded cable @ 0.39 db/mile equals approximately 1.8 db.
Hence, the losses are summed arithmetically as follows:

(1) "5" Office Loop	—2.3 db
(2) "6" Office Loop	—4.9 db
Interoffice Trunk	+1.8 db
	—5.4 db

Effect of High Efficiency Instruments On Plant Design

The example cited above would certainly represent a maximum effective transmission loss for at least 95 per cent of the inter-office connections between the "5" and "6" offices in Lincoln, Neb. Referring to the objectives previously listed, it can be seen that this loss is some 7.4 db better than the suggested objective.

The example just stated is somewhat hypothetical in that instruments of the latest design are not in common use and resistance—rather than transmission—has been the controlling loop design factor for some time. Such design figures are realistic, however, for use in future cable distribution design. As the signaling limits are extended for switching equipment, it can be readily seen that greater use can be made of smaller gauge distribution cables without falling below the recommended transmission standards.

The dollar savings in copper content of cables alone provide a strong case for the modern telephone instrument. Actually, the above case has been oversimplified to illustrate the reference system. No single figure will adequately describe loop losses as will be explained later.

The over-all effective transmission loss of —5.4 db arrived at above merely means that this connection is 5.4 db better than the reference system.

Absolute Reference System

It is understood that a more absolute reference system is in the offing. At such time as this system gains popular recognition, it will undoubtedly determine over-all losses on the basis of the ratio of the loudness of the sound out of the listener's receiver to the loudness of the sound put into the talker's transmitter. If the sound heard by the listener is less powerful than the sound power of the speaker's voice, the basic loss will be positive. This is, of course, consistent with our basic concept of loss and gain. To this basic loss the adjustments for band width, line and room noise, and sidetone will then be made to arrive at an over-all *effective loss*. Such a reference system has much to recommend it and should make transmission design more readily understandable.

Significance of T+R/2

In local loop design the engineer uses the simple relation T+R/2. This is an expression for the transmitting loss (T) plus receiving loss (R) divided by two, of the loop under consideration. This method of computing loop loss is sufficiently accurate for most design problems.

In common battery operation, the transmitting loss (T) varies with battery current to the transmitter as well as the attenuation of the loop. This "battery supply loss" causes the transmitting loss to increase more rapidly than receiving loss with loop length. Therefore, the average value of transmitting and receiving losses is used to express in one figure, the relative capabilities of any given loop.

Transmission Design Problems

With this somewhat voluminous foreword, we can now turn to some of the general aspects of the transmission design of subscriber loops, exchange trunks and toll or inter-toll connecting trunks.

Loop losses within the area served by an office will, because of the variation in lengths and composition, cover a wide range and attention must be paid to their percentage distribution. The only loss encountered in local loop design which can be accurately represented by a single figure is the exchange trunk loss. This assumes that all of the trunks between two offices are of the same length and type and, hence, of the same loss. Therefore, in considering transmission on calls between two different central offices the percentage distribution of each office must be determined and the fixed trunk loss added to obtain the over-all effective loss. By so doing, one takes into consideration the whole range of loop losses at the two ends plus the trunk loss. This is the reason that the proposed objectives were stated in terms of distributions.

Design Allocation of Losses

While the separation of loop and trunk losses has not been practiced of late, new instrumentalities have made such separation feasible. It has long been recognized that low trunk losses are the predominate factor in local plant design inasmuch as "a db out of a trunk is a db advantage to all subscribers, whereas a db reduction in limiting loop loss helps only a few."

However, with the advent of improved instrument design it becomes practical and economical to realize a material transmission improvement or gain on long loops and thereby reduce the theoretical limiting loop considerably. The modern sets also give us an opportunity to provide minimum cost loop plant without impairing transmission.

That is to say that 26-gauge might well be used in place of certain 24-gauge cable extensions, etc. At pres-

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ent, full advantage of the high efficiency sets may in some cases not be realized because of resistance limitations imposed by central office equipment. In this connection, there is an excellent possibility that signaling and supervision ranges may be extended beyond their present limits by modification of existing equipments in the foreseeable future. When this is accomplished the transmission gain of the new instruments may be more fully realized.

Instrument Zoning

The zoning of instruments in your plant to utilize the improved type sets in situations where longer loops are created by new cable layouts, area transfers, extensions of the supervision range, or similar circumstances offers a practical approach to improving your present limiting loops. The replacement of existing sets can only be dictated by the economy and the need to improve transmission. In summarization, the two important problems in this field are the reduction of loop costs and the improvement of transmission to the user.

Exchange Trunk Design

It was stated in a previous paragraph that exchange or inter-office trunks were the logical place to maintain losses at an absolute minimum. Such action has until recent years proven rather costly. The recognized procedure has been to provide larger gauge loaded conductors. Recent developments in voice repeater and carrier equipment, however, have recommended that another look be taken at exchange trunking.

In order that exchange trunked connections can be brought into the desired transmission pattern, the maximum losses added by exchange trunks must be reduced from their present value (if in the order of 8 to 12 db) to the range of 4 to 6 db. This objective must hold for connections over tandem trunks as well as direct trunks. To accomplish this end and yet retain an economical trunk plant, it perhaps in some cases will be necessary to employ exchange trunk type repeaters similar to the Western Electric E1, E2 and E3 equipments.

As to short-haul carrier it appears that on moderate-sized plants the art has not yet progressed to the point where such systems can be proven in for exchange trunking. However, there are indications that this will not be the case in the coming years. Progressive planning and engineering methods should give due weight to all of these factors.

Example of Inter-Office Trunk Design

Perhaps an illustration of inter-office trunk design using the trunks between the "5" and "6" office at Lincoln, Neb., will prove beneficial. As previously stated, some 23,500 feet of cable is required to connect these two offices. It became necessary to provide 100 additional trunks to meet traffic requirements. The reasonable methods of provision were summarized as follows:

	Facilities	*In Place Cost*	*Over-all Loss*
(1)	100 pr. 19 ga.	$37,600	5.6 db
(2)	100 pr. 22 ga.	24,500	8.0 db
(3)	100 pr. 24 ga.	19,500	9.4 db
(4)	100 pr. 19H88	39,900	1.8 db
(5)	100 pr. 22H88	26,800	3.6 db
(6)	100 pr. 24H88	21,800	5.0 db
(7)	100 pr. 19 ga. Exch. Reprs.	52,600	0.6 db
(8)	100 pr. 22 ga. Exch. Reprs.	39,500	3.0 db
(9)	100 pr. 24 ga. Exch. Reprs.	34,500	4.4 db

With an over-all transmission requirement of 4 db or less, it became apparent that there was but one logical choice, namely, 22-gauge cable with H88 loading. The provision of repeaters on 22-gauge cable was discarded in that some $12,700 would be required over 22H88 cable with but a 0.6 db saving in loss.

Tributary Trunks

Toll tributary trunk transmission requirements can be handled in much the same manner as exchange and inter-office trunking. That is, once the subscriber loop loss distribution of a given exchange area has been determined, the loss of such trunks is established with reference to inter-toll trunk losses to provide a percentage distribution on toll and extended area service calls which will conform to the previously stated objectives. This will ordinarily mean cutting the loss of such trunks as much as possible. Here again it will be necessary to take full advantage of existing facilities as well as new repeaters and carrier systems.

Inter-toll Trunks

The situation with respect to inter-toll trunks is that there are now available equipments and methods which will permit obtaining substantial improvements in transmission economically, with the major engineering problem being one of making the best possible utilization of these facilities. With the ever increasing use of carrier and voice repeatered circuits in our inter-toll plant, we can expect to work many of these circuits at or near zero loss and yet maintain adequate echo and cross-talk margins. In this way, we can take full advantage of such facilities in reducing over-all effective losses in conformity with the requirements of an integrated inter-toll network.

The General Toll Switching Plan is a plan with the purpose of maintaining continuous and proper balance between traffic handling, transmission performance and plant costs. Its major purpose is the development of engineering concepts necessary to provide nation-wide toll dialing. The plan will grow and develop as the art and conditions change. Extension of nation-wide toll dialing and availability of new short-haul carrier systems and repeater techniques will require marked changes in the plan.

Necessity for Design Coordination

The general transmission objective in inter-toll plant and circuit design is to provide the lowest practicable inter-toll trunk losses on all connections, short or long, consistent with maintenance being in proper balance with cost and other factors. An important problem is how to design an individual circuit so that when connected to one or more other circuits designed according to the same principles, the over-all loss of the combination will approach this objective as closely as possible.

In order that some guide could be used to ascertain the loss which an inter-toll facility having repeaters or gain producing equipment should contribute to the over-all loss, certain "via net loss factors" (VNLF) were established. Via net loss is a term applied to the loss inserted by a circuit when said circuit is in a switched connection. That is to say, that the *line* loss between two exchanges is all that goes to make up the via net loss. Switching pad and drop losses are excluded from this value.

The via net loss *factor* affords a unit loss value (per circuit mile) which can be applied to different types of toll facilities to determine the optimum via net loss. This factor is selected to provide minimum loss and yet be consistent with echo, noise, cross-talk and singing margins. The following factors assume the use of 2 db switch pads as the best compromise with larger values in specfic cases. Typical values of VNLF are shown below for circuits having gain producing elements. For non-gain circuits, the lowest possible design loss is applied.

VIA NET LOSS FACTORS (VNLF)

Facility	*VNLF (db per mile)* 2 Wire Circuits	4 Wire Circuits
19 B88-S	.040	...
19 B50-P	.030	...
19 H88-S	.030	...
19 H50-P	.030	...

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Working With People

By GILBERT R. BRACKETT

PART II

LET US REPEAT—one way of knowing our people is through observation and study. There is another way, a most excellent, a most interesting way—by listening.

There is really an art to listening. In fact, courses in just listening are being taught at some of our leading schools about the country. Often troubles put into words disappear. Men and women who are unable to get rid of their unhappiness by talking it out at home sometimes bring the grievance to work with them.

It is well known to psychologists that unspoken emotions can sour a life for years. It's human nature for one to want to put his best foot forward, so when a person gets to the point of saying what's on his mind, telling of the thing over which he has been brooding, it may sound so harsh and trivial he will change his mind entirely.

We can make use of the art of listening both on and off the job. There is a lot more to it than just listening for an opportunity to speak. We have sometimes found it difficult to be a good listener, possibly due to our having been accustomed to making decisions, supervising people and consequently we want to "tell them" instead of encouraging them to free discussion and listening to them.

If we are to become good listeners, we must give our entire attention to the person speaking, listen to what he has to say and especially how he says it. Make it clear by your attitude and manner that you are interested and sympathetic. We must use tact, talking as little as possible.

Our job is to listen and consider very carefully everything the person is saying. We may insert a question here and there, if we feel the person might express himself further on some particular phase or problem but, generally, the person will continue to talk if he feels that we are listening and understanding.

Don't ever argue! We might win the argument but in so doing lose a friend and also ruin any chance to help the person. Everyone likes to express his opinions or views, especially to his supervisor and that is why you should always be a good listener. Encourage your people to talk, talking gives them the chance to get the "little things" off their minds—little things that might snowball into big things.

Do not interrupt. It is important to let the person express himself fully. Should we interrupt, contradict, or try to force advice, the person might "clam up" and that wouldn't be good—not good at all.

By careful listening, we can find out most everything regarding his problem—it may be something entirely different than what he is complaining about. It could have been a bad day at home—home troubles sometimes cause complaints about conditions in the office or on the job. Before we make any decisions that affect a person, let's give him all the chance in the world to talk. They will accept our decisions more readily and in much better spirit if all their views have been considered.

There are three things we should listen for, if we are to be good listeners:

(1) What the person wants to say.
(2) What the person does not say.
(3) What he cannot say without our help.

Listening to what the person wants to say is easy. A person usually can say what he has in mind. As you listen attentively, you learn a great deal about the person, about his family, his likes and dislikes about the work, his ambitions and job preferences.

Listening for what the person does not say, or cannot say without help, is a great deal more difficult. Listening is utterly unselfish, you must realize this. You must let him run the show. You must have faith in his ability to work out his own problem. There is an old adage—"No person is ever wise enough to advise on another man's problems." Giving advice, even though asked for, can keep the person in trouble from pushing on to a real solution of his own.

In all listening we have to be practical. There will be times when we will be busy and unable to listen to a long dissertation because of pressing job needs. In these cases, we should let the person know of the reason for our seeming abruptness and follow through as soon as we can conveniently do so.

Let's keep in mind, and be constantly on the alert for, comments that will indicate an unfavorable attitude, dissatisfaction or any personal problem. If we have cases that we feel might require more attention than we will have time to give them, or when our efforts have failed to help certain people, then we should call our supervisor into the picture for his suggestions and counsel.

When we are first assigned to a supervisory position, it is usually our tendency to rush into the job with verve and energy. But let's go slow—we'll make fewer mistakes that way. If you start at once to correct even one of your people, your whole group will judge you accordingly.

Certainly there are some things you can do at once—little constructive things that apply to the job. It will show your interest in your people and your desire to be of help to them. Don't get into the habit of finding fault with things—your people will dread to see you coming. It is up to every supervisor to establish good relationship. Have something interesting to tell your people, give them encouragement or commend them.

We want to be alert to our people's reactions to our requests, suggestions and supervision. Some of the signs of favorable reaction are:

(1) Pleasant tone of voice.
(2) An expression of thanks.
(3) Questions that demonstrate interest.
(4) Requests for assistance.
(5) Voluntarily giving information about himself, the job and his ambitions.

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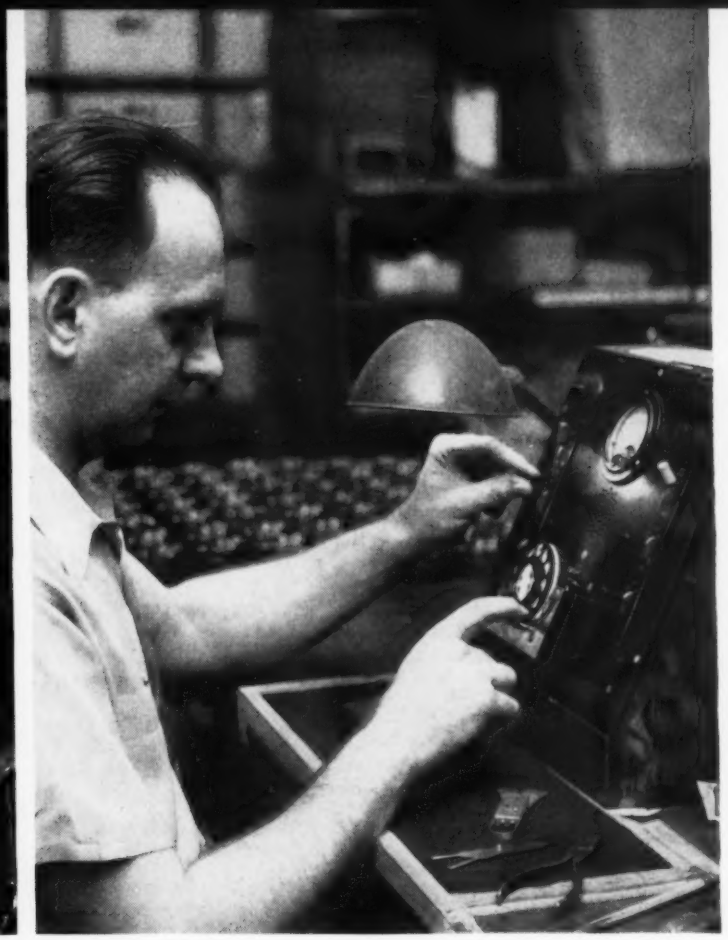

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". . . And *of course* we want Automatic Electric dials!"

More and more you hear it—this demand for Type 51—the dial with the "A.E.Co." on its base. Here's why that "A.E.Co." is so important:

In design, "A.E.Co." stands for *extras* like dial know-how. Automatic made the first dial and has been adding to its store of dial data ever since. Automatic's designers draw on this great fund of knowledge as they shape each part and choose the proper material for it.

In testing materials, "A.E.Co." stands for *extras* like making sure that steel has the sulfur content needed for accurate machining, and that phenol fibre is free from shrinkage risk.

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In final testing, "A.E.Co." stands for *extras* like exceptionally high standards and the care taken to be sure every dial is *right.*

That's why they all demand Type 51's. Do likewise—today!

Address: Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7.

AUTOMATIC AE ELECTRIC ®

XUM

Iowa Association Plant Committee Conducts Cable Splicing Course

By WILLIAM F. MILLER *

IT HAS BEEN SAID that expert cable splicers keep to themselves the many tricks of the trade that they acquire down through the years—that they are reluctant to pass on their knowledge and skill. This was not so at the cable school sponsored by the Iowa Independent Telephone Association and the Engineering Extension Service of Iowa State College.

The instructors at the one-week cable school "shot the works." Unsolicited comments by some of the students near the end of the course supported this. They confessed they had been told and shown the distillate of many years of cable experience by the instructors who were veteran cable men in the Independent telephone industry.

Twenty-nine Iowa telephone men were eager and enthusiastic students at the one-week cable school sponsored jointly by the Iowa Independent Telephone Association and the Engineering Extension Service of Iowa State College, Ames.

The students and instructors checked in at the Memorial Union Building on Sunday evening, Dec. 5. The cable school was "in being" at 8 a.m. Monday morning.

As planned by the plant committee of the Iowa association, the students got right down to work in learning and doing.

Fundamentals of splicing both lead and plastic cable were taught and practiced. Each student wiped two lead joints which were later pressure-tested. The latest techniques of splicing plastic cable were also demonstrated and practiced.

The 44-hour course included two-hour evening classes. Here are the highlights from the course outline:

First Day:

History and evolution of telephone cable.

Film on safety practices: "Danger Is Your Companion."

Aerial cable construction practices.

Use of hoist, dynamometers, spinner, Strandvises, lashing, spacers, strand-slack puller, etc.

"Twisting Cable Wires," a film.

Twisting wires—practical work by students.

Second Day:

Use of paraffin, lead dessicant, etc.

"Joint Wiping," a film.

Lead-wiping procedure — demonstration and actual practice.

Pressure testing, use of Prestolite, and tagging.

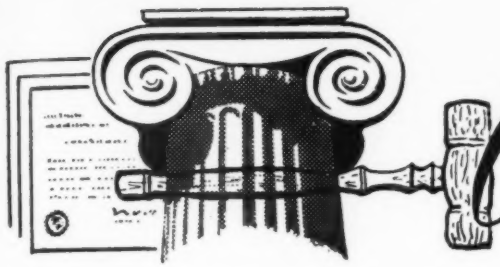
Third Day:

Tape method of splicing plastic cable —lecture and demonstration.

(Please turn to page 34)

*Mr. Miller is secretary-treasurer of the Iowa Independent Telephone Association.

Students and instructors who attended the recent five-day course in cable splicing jointly sponsored by Iowa Independent Telephone Association and Engineering Extension Service of Iowa State College, included: Top Row (left to right): WILLIAM DAUBENDIEK of Jefferson, instructor; HARLAN COZART of Olin; BERNARD PISTER of Centerville; EUGENE SEVIER of Creston; DALE MAUER of Afton; THURMAN HEADELLIN of Newton; JAMES CREES of Sheldahl; LEROY GALLAGHER of Vail; LESLIE POESCH of Postville; THURLOW BIEMERS of Sioux Center; EDWARD G. CARLSON of Creston, president of the Iowa association, and GENE DAUBENDIEK of Jefferson, chairman of the plant committee and instructor at the cable school. Third Row: FRANK DIXON of Knoxville, instructor at cable school and member of plant committee; ARTHUR SCHNEIDER of Ames; WALLACE CHANCE of Thompson; NORMAN HENDERSON of Central City; HARRY MEUGNIOT of New London; HERSCHEL FLATER of Wilton Junction; JOHN NATH of West Liberty; FRANCIS ZERWAS of Manning; J. F. DOWNIE SMITH, dean and director of engineering, Iowa State College, and WILLIAM F. MILLER, secretary-treasurer of the Iowa association. Second Row: JOHN FARRINGTON of Centerville, member of plant committee; ROBERT GUNNING of Clare; GEORGE HURLEY of Jefferson; ROBERT SMITH of Toledo; DONALD GRAY of Lime Springs; JAMES OLINGER of Manchester; TRACY STAINBROOK of Brandon; ROGER CRAFT of Mediapolis; MARTIN WADE of Paullina, and ROSS HENNINGER, assistant director, Engineering Extension, Iowa State College. Front Row: DONALD RAAK of Hospers; CHARLES COY of Villisca; BASIL DUFFY of Mallard; IRA FRYE of Bussey; ROGER TURNER of Jefferson, and CHARLES BYERS of New London, instructor.



Courts and Commissions

Bill Seeks to Change Ohio's Rate Formula for Utilities

A bill to change Ohio's rate-making formula for public utilities was introduced in the state legislature on Jan. 5 by Rep. George Hook Jr. (TELEPHONY Jan. 1, p. 17, "In The Nation's Capital," by Frances X. Welch).

The measure would provide that utility rates be figured on "fair value" of property applied to making the service. Ohio rates now are figured on reproduction cost new less observed depreciation.

V V

Missouri Independent Sold; Will Request Rate Raise

The Mirabile (Mo.) Telephone Co., has been purchased (TELEPHONY, Feb. 27, 1954, p. 33), by Deola McMillian, Kansas City, from Harry Bradshaw, also of Kansas City, it was reported on Dec. 28.

Some changes and improvements are planned by Mr. McMillian, which will include increasing the territory, and a long-distance line to Kingston in cooperation with the Middle States Utilities Co., which owns the telephone property at Kingston.

The Mirabile company has asked the Missouri Public Service Commission for approval to increase the rates, effective Feb. 1, 1955.

V V

Southern Bell Seeks Release From Tenn. Order to Serve

Southern Bell Telephone & Telegraph Co., on Jan. 6 filed an appeal in Davidson County Chancery Court at Nashville from an order of the Tennessee Railroad & Public Utilities Commission seeking to force it to provide service to the towns of Hornbeak, Samburg and McLemoresville.

Southern Bell General Manager Sam Youngblood contended that "before undertaking to furnish service in new areas, formerly served by Independent companies, we want to catch up on the demand for service in our own exchanges."

The company's petition also charged that the state commission is without authority to force a company to extend its facilities beyond the boundaries of its "duly established service area."

Extension of service to these areas, the petition said, would have to be done "at a substantial financial loss."

Hornbeak and Samburg are in Obion County and McLemoresville is in Carroll County.

V V

Owner of Kansas Independents Purchases Another Company

The Erdman Telephone Co., Arcadia, Kan., has been sold by Phil Erdman to V. L. Higginbotham (TELEPHONY, Jan. 8, p. 36). Mr. Higginbotham also owns the Mulberry and Walnut telephone exchanges.

The three systems will be operated individually, it was reported.

V V

Cases Scheduled for January Before Wisconsin Commission

The Wisconsin Public Service Commission is scheduled to hear the following cases this month:

On Jan. 17, the application of the Central Green Lake Telephone Cooperative for authority to increase rates.

On Jan. 18, the application of the La Valle Telephone Co., for authority to increase rates and to discontinue unlimited inter-exchange service to Lime Ridge.

On Jan. 20, the application of the Cazenovia Telephone Co., for authority to increase rates.

V V

Nebraska Independent Given Go-Ahead on Rate Increase

The Kearney County Independent Telephone Co., Norman, Neb., was authorized by the Nebraska Railway Commission on Jan. 4 to increase rates 75 cents on all classes of service. Rates for business, residence and rural service are increased from $2.00 to $2.75 on a net basis.

Under the new rates the company's operating revenue is estimated to be $4,482; expenses, $4,727, which results in an operating loss per year of $245.

The company is a corporation with an authorized maximum capitalization of $30,000. It has 338 shares of stock outstanding at a par value of $40 per share. Magneto type service is provided over both metallic and grounded lines to 121 subscribers.

The commission also ordered the company to follow the uniform system of accounts as prescribed for Class E telephone companies and to file monthly financial statements with the commission.

V V

Wisconsin Independent Gains $6,105 Added Revenue

Added revenue of $6,105 annually was authorized for the Weyauwega Telephone Co. on Dec. 23 by the Wisconsin Public Service Commission (TELEPHONY, Oct. 9, p. 46).

Rate increases for the company's Weyauwega and Fremont exchanges were sought to reimburse it for higher operating expenses and investment costs, according to its application.

There are 1,600 subscribers in the company, 297 of them at Fremont and 714 at Weyauwega.

In Weyauwega the one-party business rate will rise from $4.60 to $5.45, the one-party residence rate from $3.60 to $4.10, and the rural rate from $2.30 to $2.85 a month.

At Fremont the one-party business charge will be raised from $4.00 to $5.25 a month, the one-party residence schedule calls for $3.95 instead of $3.00, and the rural rate will be $2.50 instead of $1.90.

The commission said it figured the schedule on a rate base of the company of $161,779, and calculated a return on that base of 6.12 per cent.

V V

Virginia Indpendent to Issue $500,000 First Mortgage Bonds

Virginia Telephone & Telegraph Co., Charlottesville, serving about 34,000 subscribers in central and southern Virginia, was authorized Jan. 6 by the Virginia Corporation Commission to issue $500,000 worth of first mortgage bonds.

The bonds will be payable in 1980. In a rate increase hearing before the

XUM

commission last summer, the company had declared its intention of issuing the bonds.

Increased rates went into effect on Aug. 1.

V V

Wisconsin Rural Company Seeks Rate Adjustment

The Schleswig Telephone Co. has asked the Wisconsin Public Service Commission for a hearing on a proposed raise in rates, it was reported on Dec. 23. The company provides rural telephone service in the Kiel and New Holstein vicinity.

William Ree, general manager of the Schleswig company, says that rates charged are the same as those in effect for many years and that the company has not paid a dividend since before the war.

V V

South Carolina Commission Authorizes Sale

Sumter Telephone Co. recently was authorized by the South Carolina Public Service Commission to sell certain properties to Farmers Telephone Cooperative, Inc. (TELEPHONY, Dec. 11, 1954, p. 30).

The sale comprises parts of the Sumter company's lines in Sumter, Clarendon and Lee counties.

V V

Illinois Bell Refused in Plea For $24,900,000 Rate Raise

The Illinois Bell Telephone Co.'s petition for a $24,900,000 annual increase in its rates was denied on Jan. 15 by the Illinois Commerce Commission (TELEPHONY, Feb. 27, 1954, p. 32).

The five commissioners denied both the rate increase and certain revisions in service to suburban users which the company said were designed to encourage wider use of telephones. The company filed for the rate increase on Feb. 19, 1954.

William V. Kahler, company president, announced the company would file for rehearing by the commission.

It was the fourth rate request made by the company since 1946. In three previous cases, two of which were won only after extensive court litigation, the company gained a total of $70,335,000 in rate increases.

While the commission refused the service revisions, which would have offered a wider calling area for suburban subscribers within a 28 mile radius of Chicago's Loop, it said it would have no objection to a separate petition being filed later for this plan.

The commissioners, headed by Chairman George R. Perrine, held that the company is earning a fair rate of return of 5.5 per cent on its properties. The company claimed it was earning only 4.5 per cent and was entitled to between 6.5 to 7.5 per cent.

The commission calculated the company's 5.5 per cent return on a basis of 627 million dollars as fair value of the company properties. It computed this by weighing the following figures, also determined by the commission: $709,800,000 as reproduction cost of property less depreciation; $545,698,161 as original cost of property less depreciation.

The company contended reproduction cost less depreciation should be considered the fair value figure for determining the rate of return. It set this figure, as of Aug. 1, 1954, at $721,479,197.

In its three previous postwar rate cases, Illinois Bell had sought a total of $87,200,000. The first case, in which $30,300,000 was requested, resulted in a $25,378,000 increase in December, 1947.

The second case, involving a $34,100,000 request, wound up in the Circuit Court of Winnebago County after the commission granted only $22,795,000. In resulting court action, Illinois Bell won an additional $5,644,000.

The third case, one which was not settled until after 27 months of court and commission hearings, ended with the company winning a $16,518,000 rate boost, in April, 1953. In this case, the commission denied the company all of its $22,800,000 rate request.

The case was appealed through Kane County Circuit Court to the Illinois Supreme Court, which held the commission erred in its calculations (TELEPHONY, Nov. 27, 1954, p. 31).

At commission hearings, Bell company officials testified wage costs were taking 50 cents of every revenue dollar compared with 20 cents for electric utilities and 25 cents for gas utilities. They also testified the company had increased its plant at a rate of 83 million dollars annually since World War II.

V V

N. Y. Commission Authorizes Sale of Independent Plant

The New York Public Service Commission on Jan. 12 authorized Patrons Telephone Co., Lysander, to sell its plant to Cato & Meridian Telephone Co. and Oswego County Independent Telephone Co., Fulton (TELEPHONY, Nov. 27, 1954, p. 32). Certificates were granted to the new purchasers for operation in the areas each will take over.

Under terms of agreements entered

Construction
and
WITH THE DOUBLE
STROMBERG-CARLSON
LEADING

For DEPENDABLE TELEPHONE SERVICE
it's Copperweld TRADE MARK
ALL ALONG THE LINE

With Copperweld Line Wire, voice and high frequency transmission properties are excellent—far better than with any other high-strength conductor. Copperweld gives you the rust resistance and durability of copper plus 2 to 3 times its strength.

Light in weight, high in strength, and easy to string, Copperweld is the ideal wire for long-lasting, long-span construction. It assures dependable service all along the line.

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flotrol automatic battery charger

reduces operating costs!

Model 2500-B
50 Amps., 50 Volts

GREATER POWER SAVINGS—The unusually high efficiency of this 3-phase self-contained unit (50% at 10% of rated load and 75% at 40% rated load), results in continuous power savings to the FLOTROL user, sufficient to pay for the unit in less than its anticipated life.

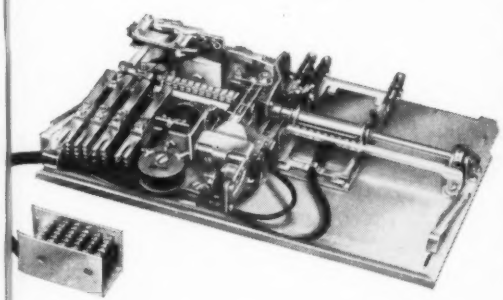
REDUCED MAINTENANCE COSTS—The FLOTROL contains no moving parts; once installed, requires no further attention.

MAXIMUM BATTERY LIFE—By floating the battery at constant voltage, battery activity is reduced to a minimum.

DC voltage delivered is regulated within 1%. Complete overload protection is as automatic as charging itself.

WRITE for Bulletin 161—completely describing the FLOTROL system for 3-phase operation.

investigate the trend to the "XY" System

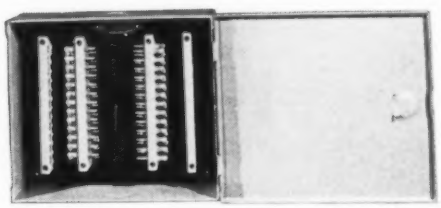


America's fastest-growing dial switching system . . .

Maybe it's because the XY Switch is instantly interchangeable as line finder, selector and connector. Maybe it's the Twin-Bladed Wipers, as long-lived as the switch itself. Maybe it's the Fourth Wire built right *into* the system. At any rate, "XY" acceptance is increasing in a measure unparalleled in dial history. You owe it to yourself to investigate!

●

Stromberg-Carlson "XY"



cook type "57" interior terminal box

The type 57 interior terminal box is for distribution and termination of lead-covered or loom cable for low-voltage circuits. The box itself which has an Underwriters' Laboratory listing is constructed of smoothly enameled steel, with hinged cover and necessary knock-outs. Fanning strips and terminal strips are provided as well as screw connectors on the drop sides and solder clips for cable wires.

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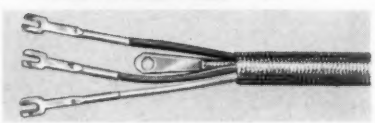


BUY!

COTTON

Are you familiar with the features of these fine cords?

NEOPRENE covered cords are a highly serviceable cord, extensively used in a wide variety of services. They are moisture and grease proof . . . easy to keep clean.

NYLON covered cords are a relatively new development in telephone cords. Their fine smooth texture makes them the preferred cords for switchboard use. They give long service. Preferred by operators because of their fast, easy handling.

COTTON cords are in standard use everywhere. Their fine woven wrap makes them very serviceable for all around purposes.

Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry a large stock of cords for every purpose.

Our geographical location means QUICK SERVICE.

RUNZEL
Cord and Wire Co.
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.

into by the three parties to the current proceeding and which have been approved by the commission, Cato & Meridian will acquire 297 stations and will give to Patrons 266 shares of stock plus cash to cover the cost of the properties it is acquiring. Oswego County Independent will acquire 148 stations.

Steps leading toward the sale of Patrons' operating plant were initiated by it after the commission last year directed the company to make plant improvements and to provide toll-free service to adjacent territories served by other companies. That order resulted from a commission investigation of complaints filed with it by subscribers. Patrons subsequently ascertained that the cost of required improvements would approximate $40,000 and because it was unable to finance such a program entered into negotiations for the sale of its plant, the commission reported.

Initially, Cato & Meridian offered to buy the entire plant of Patrons Telephone. Oswego County Independent subsequently made a similar offer. Both proposals were rejected by Patrons' board of directors because neither proposal received the 60 per cent vote required by company by-laws. The compromise agreement providing for division of the territory was later evolved.

V V

Illinois Independent Granted Rates for 5.8% Return

The Illinois Commerce Commission recently approved increased rates designed to return 5.8 per cent on the fair value of the Hoopeston Telephone Co. plant (TELEPHONY, Nov. 20, 1954, p. 32).

In arriving at the new rate schedule, the commission found the company's figures correct for original cost of property, as of March 31, 1954 ($270,-245.10); also for depreciation reserve, as of March 31, 1954 ($76,776.24), leaving a net original cost of $193,-468.80.

However, the commission determined that the reproduction cost new (RCN) of the physical properties, as of March 31, 1954, was $515,177, whereas the company had offered $583,250 as the RCN. The commission went on to ascertain that, after deducting the observed depreciation of $83,488, the depreciated RCN was $431,689. (The company's figure for RCN included $40,000 for cost of establishing the business. The commission said it "will not allow anything for the cost of establishing the business.")

A fair and reasonable allowance for cash working capital and materials and supplies was $26,000, the commission said. The company's corresponding figure was $26,540.

The commission then set the fair value of the company's property, used and useful, at $350,000.

Annual operating revenues, including toll revenue, under the new rates will be $175,472.71, with $20,315.43 available for interest and return.

The following are the old and the new rates:

	Old	*New*
One-party business	$4.50	$6.50
Two-party business	4.00	5.50
One-party residence	3.00	4.50
Two-party residence	2.75	4.00
Four-party residence	2.50	3.50
Rural multi-party business	2.75	4.50
Rural multi-party residence	2.50	3.50

V V

Louisiana Independent Asks Authority for Rate Increase

The Ringgold Telephone Co. Inc., has filed a petition with the Louisiana Public Service Commission seeking authority to increase its rates for telephone service.

The present and proposed new rates are as follows: one-party business, present rate, $5.00, proposed rate, $7.00; two-party, present, $4.50, proposed, $5.50; multi-party, $4.00, and proposed, $4.50.

One-party residence, present rate $4.00, proposed, $5.00; two-party, $3.50, proposed, $4.25; multi-party, present, $3.00, and proposed, $3.75.

V V

Correction

L. C. Coltrane Jr., secretary-treasurer of The Concord (N. C.) Telephone Co., Inc., has informed TELEPHONY that the rates now charged by his company for service at its Concord and Kannapolis exchanges which were incorrectly cited on page 42 of the Jan. 8 issue, are as follows:

	Concord	*Kannapolis*
One-party residence	$3.25	$3.00
Two-party residence	2.75	2.50
Multi-party residence	2.00	1.75
One-party business	5.25	5.00
Two-party business	4.50	4.25
Multi-party business	3.75	3.50

Mr. Coltrane also reported that the requested increase of $220,000 would raise net revenue to $93,000 annually, instead of $98,000 as stated.

V V

Approves Two Minnesota Sales

The Minnesota Railroad & Warehouse Commission on Jan. 10 authorized sale of the Gary Telephone Co. (approximately 160 stations) to the Twin

Valley-Ulen Telephone Co., and the sale of the Itasca Rural Telephone Co. (11 subscribers) to the Northwestern Bell Telephone Co.

V V

United of Pennsylvania To Take Over Independent

The McCrea Telephone Co., now switched by United Telephone Co. of Pennsylvania, Harrisburg, recently notified the Pennsylvania Public Utility Commission that it intended to dissolve on Jan. 1.

The United company reportedly agreed to lease the McCrea equipment, give service and maintain lines for about nine months, then install new equipment. The McCrea company was organized about 1912.

V V

Oklahoma Company Goes After First Increase in 10 Years

The Welch-Bluejacket Telephone Co. recently filed a petition with the Oklahoma Corporation Commission asking for rate increases of from 15 to 20 per cent in both their Welch and Bluejacket telephone exchanges.

The company said this is the first rate increase to be requested in more than 10 years.

V V

Arkansas Commission Hears Plans for Sale of Independent

An Arkansas Public Service Commission hearing on Dec. 28 revealed tentative plans for the sale of the Quitman Telephone Co. which serves Pangburn, Damascus, Rosebud and Greenbrier.

The owner of the firm, Douglas Fletcher, plans to sell the company to Hugh Wilbourne, who recently formed the Allied Telephone Co.

V V

Minnesota Co-op With REA Loan Gains Interim, Dial Rate OK

Fillmore County Telephone Cooperative, Houston, recently secured Minnesota Railroad & Warehouse Commission approval of two rate schedules for its Houston and Rushford exchanges.

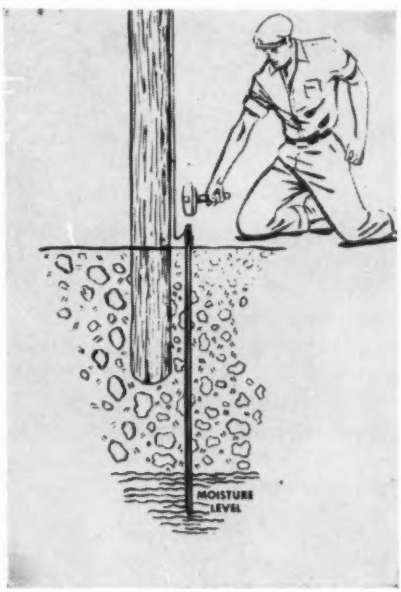
The commission noted that the release of REA funds was contingent upon the approval of the rates for dial service the company applied for.

The commission found the following to be the operating figures for the company (II) under present rates; (III) under interim approved rates after conversion of the Peterson and Arendahl exchanges to dial operation, (IV) under approved dial service rates

You may only think you're getting power-cross protection!

When a man installs a high-voltage arrester, he naturally assumes his lines will be securely protected against power-cross damage.

But he may only *think* so!



A low-resistance ground . . .

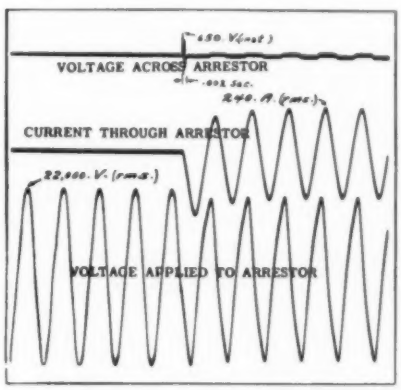
Unless he puts in a ground-rod long enough to reach the moisture level, he's asking for trouble. Ditto, if the rod is too short to reach moisture during dry spells. For in either case there will be times when he has very little power cross protection. A look at the formula E = RI shows why. (E = voltage after arrester operates, R = ground resistance, and I = current.) In theory, a 12,000-volt cross at 400 amperes should be reduced to 50 volts for *complete* safety, and to do this, the ground resistance could not exceed ⅛-*ohm*. In practice, it would be considered acceptable to merely reduce the 12,000-volt charge to a point where nearby substation protectors could handle it, and to do this, ground resistance should not exceed 2.5 ohms.

Now, for the high-voltage arrester itself: choosing a good one is no problem. Leading the field is Automatic's Type 56, which is proving very dependable in service. It contains an exclusive bi-metallic plate that bends and grounds the line. After the

. . . plus Automatic's Type 56 High-voltage Arrester . . .

current is shut off, the plate resets itself. Eliminated are fast burning and frequent replacement of carbons.

The following diagram shows how Type 56 stood up during a strenuous operating test. Note that a charge of 22,000 volts at 240 amperes was reduced to only 650



. . . equals sure power-cross protection

volts, which could be handled easily by substation protectors.

Order Type 56 Arresters today. Ask for Catalog T-4068-B.

Cat. No.	Dimensions	Shipping Wt.
SB-97	7¾" high x 3⅝" high x 2¼" wide	2¼ lbs.

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following conversion of the Houston and Rushford exchanges:

I	II	III	IV
Operating Revenues	$ 63,414	$ 73,974	$102,761
Net income	761	9,166	24,674
Original cost		343,000	732,000
Ratio net income to above		2.67%	3.37%

*Deficit

Rushford and Houston present exchange rates are:

	Rushford	*Houston*
One-party business	$4.50	$5.00
Two-party business	4.00	4.00
Rural multi-party business	3.50	...
One-party residence	3.00	2.00
Two-party residence	2.75	1.50
Four-party residence	2.25	...
Multi-party residence	2.00	...
Rural multi-party residence	3.00	...
Switched service	.75*	1.00
*Minimum charge per switching circuit, per month	3.75	3.75

All rates to be billed net and payment for service is due and payable when bill for service is rendered.

The schedules of approved interim manual net rates and approved dial net rates at the Rushford and Houston exchanges are:

	Manual	*Dial*
One-party business	$5.00	$6.25
Two-party business	4.50	5.50
Rural multi-party business	4.00	4.75
One-party residence	3.25	4.50
Two-party residence	2.75	4.00
Four-party residence	2.25	3.50
Rural multi-party residence	3.00	3.50
Switched service	1.00	1.00
Switched service line, minimum charge, per month, per circuit	5.00	5.00
Mileage charge: Beyond the local base rate area, each one-eighth mile or fraction thereof:		
One-party	.30	.30
Two-party, each subscriber	.20	.20
Four-party, each subscriber	.15	.15

V V

Kansas Independent Owner Purchases Another Company

Sale of the German-American Telephone Co., Victoria, Kan., to George Murphy, owner of the Gorham (Kan.) Telephone Co. was announced by company officials on Dec. 31.

The exchange, which serves 340 stations, has been in operation 50 years as a mutual company.

Mr. Murphy will convert the system to dial operation within the next 14 or 15 months, it was reported.

V V

To Buy Wisconsin Companies

The Amery Telephone Co., on Dec. 20, 1954, was authorized by the Wisconsin Public Service Commission to purchase the Deronda & Dwight Rural Telephone Co. (TELEPHONY, Sept. 11, p. 44).

Amery will also purchase the Deer Park Telephone Co.

V V

OBITUARIES

CHARLES G. MARKS JR., manager of the Wirecom division of Cook Electric Co., on Jan. 8 suffered an accidental death.

* * *

WILLIAM F. DAVIDSON, 30, of Brownwood, Tex., head of the Professional Engineering & Construction Co., was killed on Jan. 9 when his four-passenger airplane crashed near Centerville, Tex., during foggy weather.

Mr. Davidson and his family moved to Brownwood in November, 1951, from Gladewater in connection with his duties as an equipment engineer for Southwestern States Telephone Co., Brownwood.

In April, 1954, he formed his own company for the installation of telephone equipment, including automatic systems. With some 500 hours of flying time to his credit as a pilot, he purchased a plane last fall to facilitate travel over the wide area covered in his contracting work. He learned to fly in 1947.

His company recently installed the automatic system at Sunset, La., for Southwestern States Telephone Co. He flew there to check the installation and was en route to Brownwood when the accident occurred.

He was born Mar. 20, 1924, at West Plains, Mo., and was educated in the schools there.

During World War II, he served three years with the Signal Corps of the U. S. Army. Following his discharge, he was employed by the Automatic Electric Co., Chicago, as chief installer, and later by Southwestern States Telephone Co.

His widow, Margaret, survives, along with a daughter, Peggy Ann; a son, Tommy; his parents, Mr. and Mrs. Fleming Davidson of Kansas City, Mo., and a brother, Henry Davidson of Independence, Mo.

V V

Obstinacy in a bad cause is but constancy in a good.—SIR T. BROWN.

ONE TON CAPACITY

Linemen call this hoist a "HONEY"

Designed especially for line work

Here's a strong, fast-operating, light-weight hoist (12 pounds) with a flexible steel load chain that won't kink, bind or uncouple. Controls can be worked without removing gloves. It's rated to lift a one-ton load and it's tested to 3000 pounds.

THIS CHANCE HOIST HAS ALL THE FEATURES LINEMEN WANT

- Well-balanced, easy-to-grip handle. . . operates from either side
- "Free-wheeling" for ease in hooking to load . . . automatic locking control prevents accidental dropping of load
- Half link and full link take-up for accuracy and speed
- Easy working swivel hooks on both chain and hoist housing
- Permanently lubricated oil-ite bearings
- All working parts fully enclosed in the housing to prevent injury to fingers.

A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

CT55-2

WORKING WITH PEOPLE

Concluded from page 23

Some of the signs that denote an unfavorable reaction are:

(1) An abrupt, unpleasant tone of voice.
(2) No smile or pleased expression.
(3) Sarcasm; surliness.
(4) Expression of unhappiness and discontentment.
(5) Doesn't ask for help.
(6) Gives no information about himself.
(7) Shows little interest in the work he is doing.

We will supervise people who have had years more experience than we have. How will they react to our appointment to the new job? They feel they know more about the mechanics of the job than we will ever know and perhaps they are right. They may resent our appointment and feel that they should have had a chance.

We must remember that some of our people have turned down opportunity because of health or other personal reasons. There will be those who just don't have the job qualifications. It is only natural that some of them should think, "What does he have that I don't?"

As a "new broom" we must be patient and understanding. It is up to us to prove that our supervisor made no mistake in appointing us. We can go a long way toward winning their cooperation by acknowledging their experience and asking their help.

So let's "feel our way." There is nothing to be gained by rushing into things. We aren't interested in correcting a mistake that occurs rarely. We are after the thing that occurs frequently, but we must be sure we have all the facts. Then we should weigh what is wrong, decide what to do and then take action. But even if we are sure of what to do, let's act cautiously. If we "feel our way" the results will be faster and much more pleasant.

(To Be Continued)

V V

N. C. Company Incorporates

Griffin Telephone Co., Winston-Salem, N. C., has been incorporated with the North Carolina secretary of state as a nonstock corporation. Incorporators are H. Lee Everhart, Vestal J. Griffin and North G. Hutchens, all of Winston-Salem, and others.

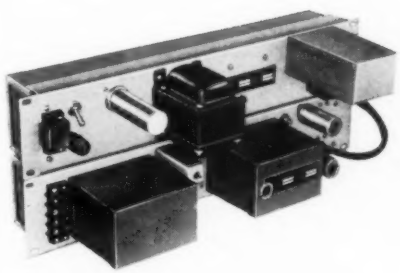
V V

Men do not realize how great a revenue thrift is.—CICERO.

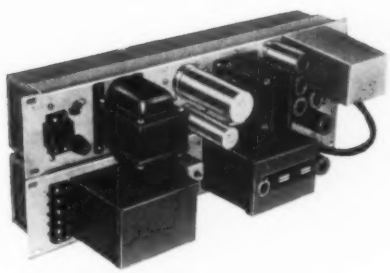
BUCKEYE CAN SHOW YOU HOW. . .

YOU CAN ADD NEW SUBSCRIBERS TO EXISTING LINES AT LOW COST

with **North's New Telephone Carrier**



Central Office Terminal



Subscriber Terminal

. . . Gives you these advantages

Provide service for waiting-list customers adjacent to lines now filled to capacity.

Reach potential customers beyond the end of present lines, without the cost of new construction to that point.

Provide private, two-party or four-party lines not now available, with resulting improvement in rate earnings.

Free physical circuits for paystations or other special revenue telephone service now blocked by lack of capacity.

Meet demands for special temporary service, such as resorts, construction camps, etc., where carrier can be moved to meet changing requirements.

Offer improved service to customers now on overcrowded lines.

Technically explained and illustrated in BULLETIN C-541

FOR FURTHER INFORMATION WRITE FOR BULLETIN C-541

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. **COLUMBUS 21, OHIO**

XUM

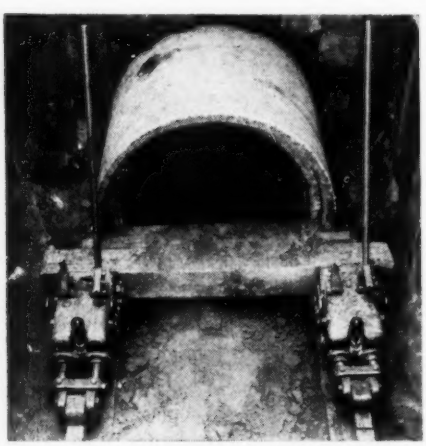
FAST, EASY WAY

TO INSTALL PIPE...

AT LOWER COST

PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.



TOOLS FOR CRAFTSMEN
GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2061 Columbia Avenue, Rockford, Illinois, U.S.A.

IOWA ASSOCIATION

Concluded from page 26

Plastic cable splicing—practice work.

Trouble location—use of tone, transformers, amplifiers, etc. — lecture and demonstration.

Location of cable trouble—practice work.

Use of Megger; various types of fault-locating devices.

Cable characteristics and mathematics.

Pre-bridge calculations.

Fourth Day:

Hot jet weld demonstration.

FRANCIS ZERWAS, student from Manning, using the jet weld gun following the demonstration. Others, left to right: MARTIN WADE of Paullina; ROBERT GUNNING of Clare; KENNETH GILLETTE of Wheaton, Ill., instructor; THURLOW BIEMERS of Sioux Center, and LEROY GALLAGHER of Vail.

Hot jet weld practice session.

"Plastic Cable Splicing," a film.

Self-suspended cables — a lecture.

Location of trouble with bridge—a lecture.

Locating trouble with bridge—practice session.

Fifth Day:

Preventative maintenance—film, lecture and demonstration.

Maintenance procedures.

Twisting, wiping and use of paraffin —practice session.

Examination.

Review of examination and entire course.

Critique.

Graduation: Address, "The Independent Story" by Edward G. Carlson, president of Iowa Independent Telephone Association, and presentation of diplomas.

Members of the plant committee of the Iowa association responsible for planning the school are:

Gene Daubendiek of Jefferson, chairman; Frank Dixon of Knoxville; John Farrington of Centerville; A. C. Kelley of Clarinda; H. Filmore Melick of West Liberty, and Arthur W. Sanders of New London.

V V

General of Indiana Observes Silver Anniversary

General Telephone Co. of Indiana, Inc., Lafayette, second largest telephone company in the state, observes its 25th anniversary this year.

A special emblem emphasizing a "Quarter Century of Service" has been adopted for use on letterhead and posters. Special book matches are being prepared for distribution at all principal exchanges. The larger exchanges will have open house for public education. Another of the anniversary plans is an illustrated booklet telling General of Indiana's story.

General of Indiana was organized on Feb. 5, 1930, as the Indiana Commercial Telephone Corp., and began operations in 1932 with the consolidation of 11 companies serving 41,032 stations in 27 exchanges. Current figures: more than 130,000 telephones served through 69 exchanges in 222 communities.

When the company started operations in 1932, of the 41,032 telephones, only 22 per cent were dial. At the end of 1954, General of Indiana reported 64.33 per cent of all its telephones were dial-operated.

The company had 13 magneto ex-

changes at the start of the year, but, according to Herbert E. Hussey, company president, the company is planning to convert all of them to automatic in 1955. The company's construction budget for 1955—a total of $4,347,000—is the largest in company history.

V V

Northwestern Bell Names General Sales Head

Frederick R. Eckley Jr. has been appointed assistant vice president of Northwestern Bell Telephone Co., assigned to coordinate and promote activities in the field of merchandising and general sales. John C. Ahlstrand has been named general commercial manager for the company's Nebraska area, succeeding Mr. Eckley. Both changes are effective Jan. 10, the company announced.

Mr. Eckley is a native of Delaware, O., and started his telephone career as a commercial service representative with New Jersey Bell Telephone Co. in 1936. He was with American Telephone & Telegraph Co. from 1947 until 1952, when he joined Northwestern Bell as commercial operations supervisor. He became Nebraska general manager in June, 1953.

Mr. Ahlstrand, a native of Red Oak, Iowa, started as a commercial clerk in Omaha in 1926. He held a number of commercial assignments in Grand Island, Neb., and Omaha until he was named Omaha district manager in 1949. In 1952 he was named assistant general manager for Nebraska and in March, 1953, was appointed general sales manager.

V V

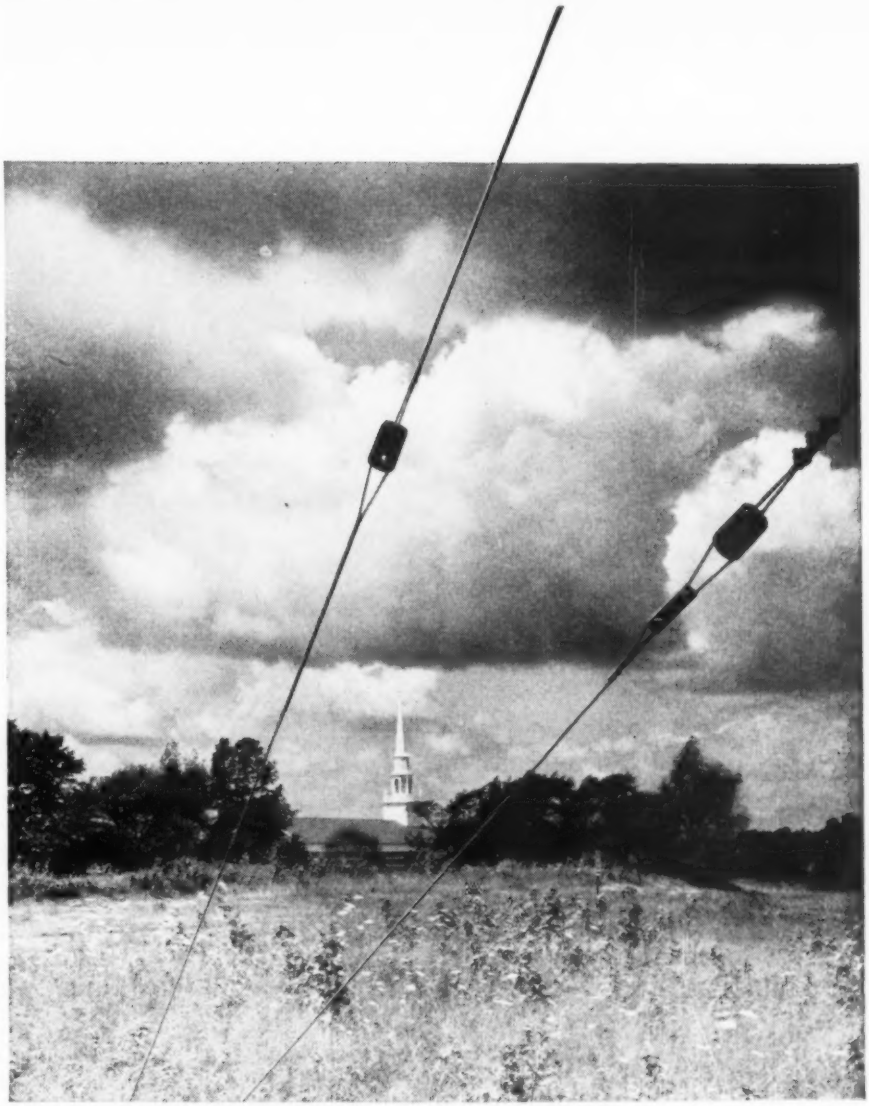
Name K. W. Mohr General Manager of Wisconsin Company

Harris G. Allen, president of North-West Telephone Co., Tomah, Wis., announces the appointment of Karl W. Mohr as general Manager. He succeeds Lester R. Gilbertson who recently resigned.

Mr. Mohr has a background of 28 years experience in the telephone industry, and with the exception of three years in Iowa, all of his business life has been spent in Wisconsin. Mr. Mohr is a former president of the Badger chapter of the Independent Telephone Pioneer Association, and he has also served as a director of the Wisconsin State Telephone Association.

V V

The age of chivalry is gone, and one of calculators and economists has succeeded.—BURKE.



Guy-Grips*

BY PREFORMED

...Economical

...Neat

...Efficient

*at the left

PLP PREFORMED LINE PRODUCTS CO.
5349 ST. CLAIR AVE. • CLEVELAND 3, OHIO

XUM

TRANSMISSION DESIGN

Concluded from page 22

19 H44-S	.020	.010
19 H25-P	.020	.010
Non-loaded v-f open wire	.01*	...
Carrier		
Open wire (all types)	...	.0017
Type K or N1	...	.0019
Radio	...	.0014

*This is an approximate factor which can be applied to the sum of open wire and entrance cable length.

On the basis of the above VNLF alone, it can be seen that a 25-mile open wire carrier circuit, before adjusting as will be discussed following, is assigned a via net loss of but 0.0425 db. This is indeed mighty short.

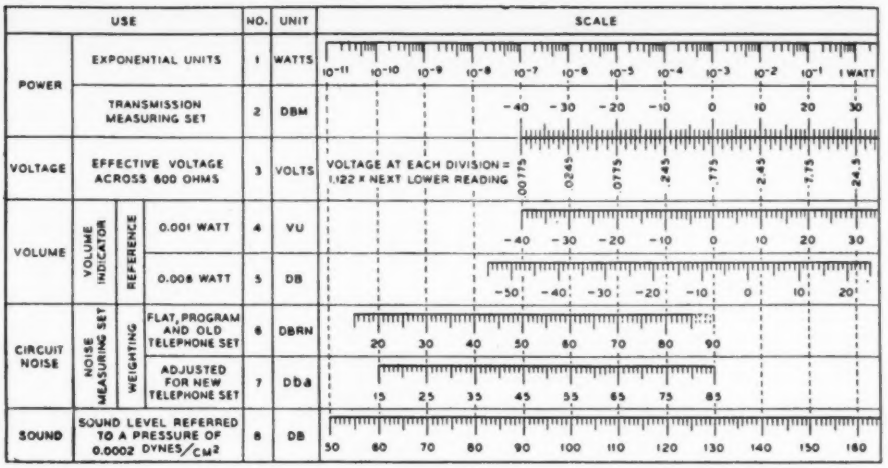


Fig. 1

Application of Loss Factors

The method of applying these factors to determine via and terminal net losses on circuits possessing gain producing equipment can be better understood by reference to the following table:

COMPUTATIONS OF CIRCUIT LOSSES

	VNL	*Usual S*	*INL*
Intermediate Links	$VNL_I = VNLF \times L + 0.4 + B$	2 db	$VNL_I + 2S$
End Links	$VNL_E = VNLF \times L + 2.4$	2 db	$VNL_E + S$

Notes

(a) VNL is the loss inserted by the circuit in a switched connection. VNL_I applying to an intermediate link, is the loss when it is switched at both ends.

VNL_E applying to an end link, is the loss when it is switched at a primary or tandem outlet.

(b) TNL is the loss inserted by the circuit on a connection terminating at both of the toll centers at its ends.

(c) Other factors and symbols are as follows:

VNLF="via net loss factor" as explained.

L=length in miles.

0.4=allowance for effect of circuit loss variations.

B=amount to be added to loss of an intermediate link for two-wire switching to take account of unbalances in the echo range between office cabling and balancing networks. Values of B vary from 0 to 1.7 db depending on return losses. A figure of 0.8 db is a usable average.

(d) The via net loss of an end link (VNL_E) is 2 db higher than that of an intermediate link (VNL_I) composed of the same length and type of facilities. Since end link circuits involve through switches at one end only, the S (switching) pad for the non-switched end is omitted and the via net loss is increased by S db so that the trunk will be suitable for use in multi-switched connections as well as terminal connections.

(e) S means loss of switching pad (or equivalent) and should usually be 2 db.

(f) In some cases cross-talk and singing limitations will prevent the obtainment of a VNL as low as is indicated by the above computations. In such cases, all that can be done is to secure the lowest losses practicable.

Example of Intermediate Link Design

Armed with all of the above, let's take a look at an actual computation involving an intermediate link between Lincoln and Omaha, Neb. The facility is a 50-mile N1 carrier circuit which is assigned a VNLF of 0.0019 db per mile. Assuming a value of 0.3 for B to take account of the two-wire switching performed at Lincoln, we can then insert values into the intermediate link formula.

$$VNL_I = VNLF \times L + 0.4 + B$$
$$= 0.0019 \times 50 + 0.4 + 0.3$$
$$= 0.1 + 0.4 + 0.3 = 0.8 \text{ db}$$

This would indicate that when a Lincoln—Omaha trunk is through-switched at both Lincoln and Omaha, the trunk will contribute but 0.8 db line loss to the connection. If 2 db switching pads are used at both Omaha and Lincoln, a terminal net loss of 4.8 db will be assigned the trunk. This, of course, means that on a call from an Omaha subscriber to a Lincoln subscriber, 4.8 db loss in the connection can be attributed the trunk.

Conclusion

Looking forward to inter-toll dial operation will bring many problems as have been indicated in the foregoing. However, it also represents many opportunities for improvements in transmission as well as for economies. When planning new plant, careful attention needs to be given to the classes of circuits which will use the new facilities. In order that these things can be done, it would seem particularly important to avoid a rigid application of "standards" but rather to base the allocations on the broadest practicable over-all picture. This is another way of saying that subscriber loop, inter-office and exchange trunk, toll connecting and tributary trunk losses as well as inter-toll trunk losses must be considered jointly if we are to work towards the objectives cited.

In this paper or any such discussion of transmission considerations, it is difficult to visualize, quantitatively, the relationship between commonly used decibel scales and their corresponding reference points. For this reason, the table in *Fig. 1* of decibel scales will serve to both augment and conclude this discussion. Said table is reprinted from the January, 1949 issue of *Bell Laboratories Record* through the courtesy of the Bell Telephone Laboratories, Inc.

IN THE NATION'S CAPITAL

Concluded from page 18

tionalized industries. That line of thought certainly does not weaken the case for charging the economic price, though it does justify an extended capital programme on new exchanges to meet the vigorous demand. But more likely the waiting list might thin out considerably; it might even become possible for the owners of shared lines to become exclusive—if after looking at the new scale of charges they still wished to do so. . . ."

The general postwar experience supports that view. It is no mere coincidence that large waiting lines develop when there is a sale of an article at unduly cheap prices.

Subscription TV

On Jan. 11, Representative Hinshaw (R., Cal.) introduced a bill in the House of Representatives (H. R. 524) to amend the Federal Communications Act. This bill, which should be of interest to all communications industry groups, deals with so-called "subscription TV." This refers to the proposal now before the Federal Communications Commission for authorizing the sending out, on an exclusive

radio reception, or closed circuit basis, television programs so that the subscribers have to pay a monthly or other periodical charge in order to receive such programs on their sets.

The idea is to give those television fans who can afford to pay, or are willing to pay, a superior type of film, or other entertainment, without the interruption of commercial advertising. It might be said that subscriber TV is just about the hottest potato that the FCC has been called upon to handle in a good many months.

Representative Hinshaw, who hails from the Los Angeles area, may be reflecting some of the movie studio sentiment in his district when he asked that Congress limit the authority of the FCC to set up television broadcasting on a paid subscription basis. Representative Hinshaw's bill would do this indirectly by taking those television broadcasters who want to operate on a paid subscription basis, out of the category of "broadcasters" and putting them into the category of "common carriers," which includes telephone and telegraph companies. On such a basis it would be necessary for the FCC to regulate the rates, services, and otherwise supervise very closely the operation of any television broadcaster seeking to go in for subscription TV.

Most of the country's motion picture studios have banded together to oppose subscription television in a petition to the FCC. Calling themselves the "Joint Committee on Toll-TV," the motion picture theatre owners specifically asked, in a 17-page petition, that the FCC hold a public hearing before making any decision on subscription TV. The Zenith Radio Corp. and others have requested the FCC to authorize immediate commercial operation of subscription TV.

The joint movie committee, whose members own about 75 per cent of the 16,000 motion picture theatres in this country, disputed Zenith's contention that commercial TV is not now "free" because the public pays for what it sees advertised on the screen. The movie theatres said the "obvious answer" to that is that the public is not required to buy advertised products. Furthermore, the petition said: "Commercial television as we know it today is as free as a public park where popcorn is sold; the patron may visit the park free of charge without buying popcorn unless he wants to."

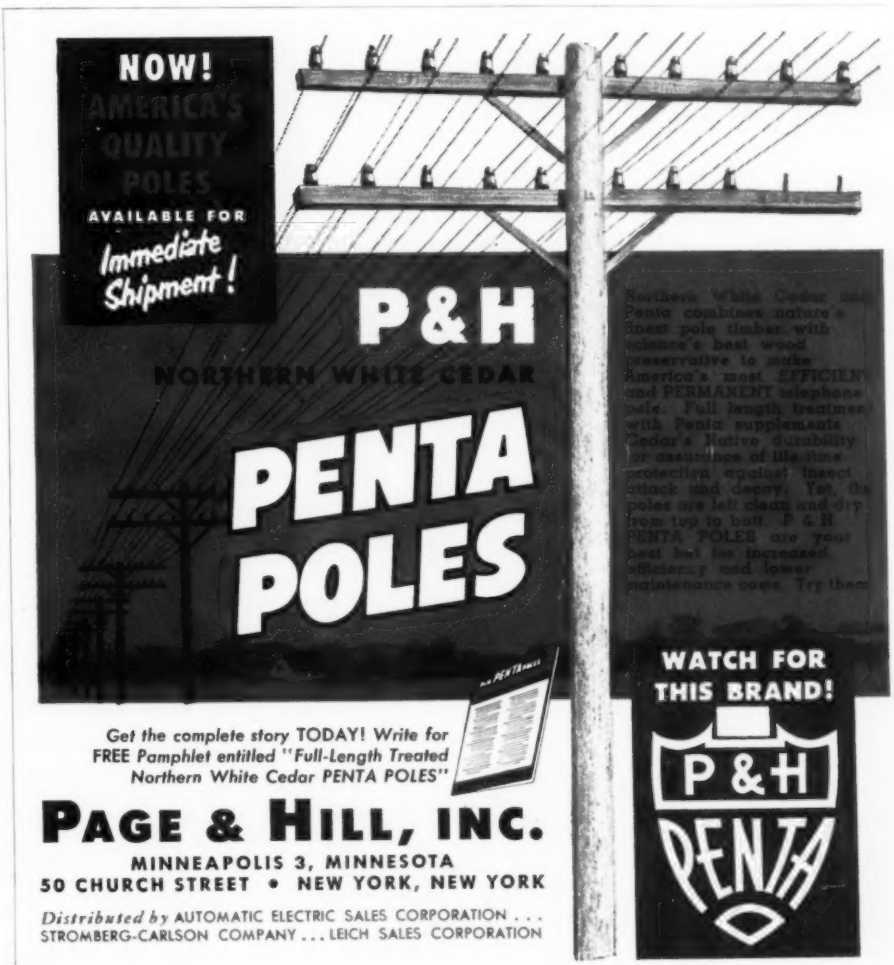
The petition added that many TV set owners, who have bought their sets on the instalment plan with the understanding they will not have to pay anything for programs, would raise a "hue and cry" if the FCC permitted programming on a subscription basis. The joint committee of movie theatres is made up of Allied States Association of Theatre Owners of America, Texas Drive-in Theatre Owners of Texas, Southern California Theatre Owners Association, The Kentucky Association of Theatre Owners, The Independent Theatre Owners Association of New York, and The Metropolitan Theatre Owners Association.

What complicates the subscription TV problem is the advent of color television. Color television is going to be tremendously expensive for the producer at the broadcasting end. Just the occasional experimental shows now being broadcast in color have opened the eyes of the TV broadcasters to the costly nature of color TV, if and when it is to be operated hour after hour and day after day (or night after night). But unless there is such extensive programming, making color TV broadcasting service available, the expected market for color TV receiving sets will be restricted for some time. Therefore, any arrangements whereby the receiving set owner can be persuaded to chip in with part of the cost would be welcomed in this infant industry. Needless to say, the motion picture industry takes a dim view of all this—pressed as it now is with forests of empty seats in the neighborhood movie houses, thanks to the plain black-and-white TV competition.

Color TV also has industrial uses and other special applications, such as educational developments. A major set maker — CBS-Columbia — recently announced that it would start making color equipment for closed circuit industrial television in the near future. Seymour Mintz, president of CBS-Columbia, TV and radio set-making division of the Columbia Broadcasting System, said his company would make closed circuit color TV equipment as part of a general expansion of its industrial products line. He said the new color equipment would be identical to that tested earlier by the parent company in various industrial and medical applications.

V V

". . . there is no way to halt knowledge so long as men seek it and there is no need to meet knowledge with hysteria. When men cease to seek knowledge they cease to be men and so come by a worse route to the end of the civilization they struggle to preserve." — EDITORIAL STATEMENT, *The Wall Street Journal*.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Here's a new convenience in cutting pliers

It's simple but plenty effective! The ***cushion*** is tough, rubbery red Plastisol bonded right beside the cutting edge. As the pliers close, the ***cushion*** grips the short end of wire, holding it tightly.

The ***"Cushion Throat"*** is specially valuable in electronics work... makes cuts inside chassis without danger of wire snips falling into set. Grips spring or hard wire too—safety feature keeps wire from flying! Order from your distributor!

Only $1 list additional—applied to most UTICA diagonal or side-cutting pliers.

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"Cushion Throat" Pliers

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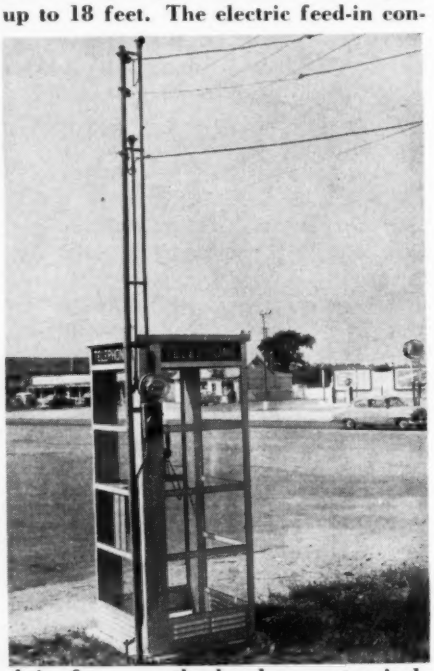
news on new PRODUCTS

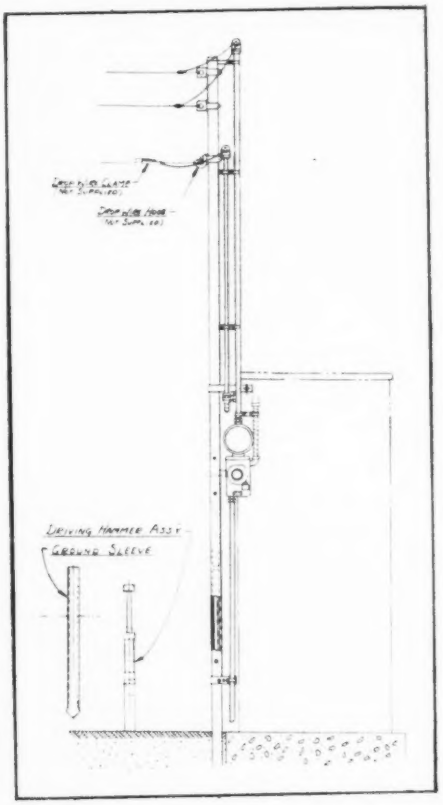
OUTDOOR BOOTH MAST. Several months ago Utility Service Company, Inc., was requested by the Bell System to design a mast which would simplify the installation of telephone and power drops into outdoor telephone booths. The new mast is now available to the Independent industry.

This mast is built from two sizes of C1050 steel tubing, one within the other to facilitate knock-down shipments and may be obtained in lengths up to 18 feet. The electric feed-in conduit, from weatherhead to meter jack, cut-off switch box and flexible connector to booth, are all assembled in manufacture, as are the weatherhead and feed-in conduit, with flexible connector to the booth for telephone drop.



All masts are finished with Miti-Mast Gray by Rust-Oleum and carry a weather resisting guarantee. (Other colors available upon request.)

This service mast is installed by driving a hollow point or ground sleeve (three, four, or 5 feet long) and placing the assembled mast into it. An ordinary sledge hammer may be used for driving the ground sleeve, however, the Utility Service Co., Inc., manufac-



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Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP355_____; NP356_____; NP357_____; NP358_____;
NP359_____; NP360_____.

Name.....Title.....

Company.....

Street.....

Town and State.....

1/22/55

tures a driving tool for this purpose. A template for locating the ground sleeve is provided with each mast, as well as complete instruction sheets. These units will fit all models of outdoor booths.

Actual installations show savings up to two-thirds over conventional pole and 4x4 installations. The mast can be moved easily to any new location by simply removing entire unit from the ground sleeve and driving new ground sleeve at new location.

This mast may be procured with any wiring features desired, such as telephone feed-in only, telephone and electric feed-in (no meter or switch box), or telephone and electric feed-in with meter and switch box, including time switch and flood lights when required. It may also be obtained without wiring features for use as a pole to attach pay telephone signs, floodlights, or as a temporary intermediate attachment. Request NP 355.

• • •

DUST REMOVER. A new small, portable machine which removes more than 99 per cent of all smoke, dust, pollen, and even some types of bacteria from the air in a room should be ideal for

telephone switch-and-frame rooms. The "Micronaire" unit has been found to keep those rooms virtually dust free, and greatly adds to the reliability of telephone service while cutting down maintenance costs, the manufacturer, Raytheon Mfg. Co., states.

The room air-cleaner was developed for the relief of sufferers from hay fever, asthma, and other allergies. In this respect, it has built up an impressive sales record since its introduction a few months ago, and a mass of accredited medical endorsements and authenticated case histories show that the machine is highly effective. But the

Why Pay 3 MEN to Watch Your Line Crew Work?

START SAVING TIME and MONEY with

TEL-E-LECT 2-MAN UTILITY RIGS

If you're using 5-man crews and old fashioned utility equipment (even on '55 chassis) you've got *three extra men on most jobs!*

With Tel-E-Lect equipped trucks you'll discover the great time and money saving advantages of 2-man construction trucks. Leading public utility companies throughout the country are now using 2-man trucks to do a large share of the work once performed by 5-man crews—and they're realizing increased profits in the process.

Your 2-man crew won't work any harder, but they'll produce more and do it faster than many 5-man crews. You see, Tel-E-Lect builds the services of three men into its utility truck equipment. Tel-E-Lect equipment provides new power features that require only two men to perform the tasks once done by five!

The 2-man construction equipment described here lets you put smaller crews on everyday jobs while freeing big crews and big equipment for the really tough highline jobs.

THE TEL-E-LECT COMBINATION BODY

This *complete* package consists of a rugged steel body, stowaway derrick, winch and drive, pole hole digger and drive and rapid forward-reverse transmission. Three simple installation steps by your local mechanic puts the Combination Body on your truck chassis regardless of make or model. You simply install power take-off . . . mount body and connect power drive . . . and install cab controls. It's now ready to go to work!

A Tel-E-Lect all steel Combination Body is completely equipped with Stowaway derrick, digger and power units—a model 2-man construction truck.

Front mounted Tel-E-Lect "T" frame derrick and Tel-E-Lect Pole Hole Digger gives this utility truck 2-man versatility.

WINCH, DIGGER AND DRIVE KITS FOR ALL POPULAR-MAKE TRUCKS

A series of easily installed Tel-E-Lect kits make it possible to install derricks, diggers and power drives at the front of your present utility truck. The flexibility and economy of 2-man operation can be extended to any size or model of International 4x4, Ford, Chevrolet, GMC, Dodge or other truck.

These Tel-E-Lect kits are designed specifically for the particular truck on which they will be installed. Each kit contains every part needed for easy installation by your local mechanic.

TEL-E-LECT SELF-STORING DERRICK CONVERSION KITS

An entirely new concept of derrick storage eliminates the hazards once involved in derrick erection and take-down. Your front mounted "A" or "T" frame derrick stores on top of the truck—doesn't use valuable body space for storage.

Your truck's winch supplies power to raise or lower derrick. With a double drum winch you'll get "live-boom" flexibility and with a single drum winch you'll get easily adjustable derrick elevation! This low cost unit fits any truck with or without body and is quickly installed.

This 2-man construction truck features a front mounted Tel-E-Lect T-45 derrick and Tel-E-Lect Self Storing Derrick Conversion. The derrick is shown in its stored position in the smaller photo.

Tel-E-Lect provides other kits for individual requirements. Write us about any of your utility truck problems.

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business world has been taking notice of the handy little device, and Raytheon now finds its new product in growing demand by industry, in applications where a dust-free atmosphere is needed.

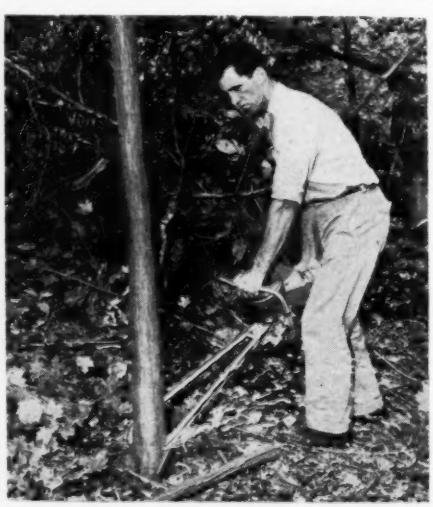
The "Micronaire" cleaner is an electrostatic precipitator. It traps all airborne particles by a form of magnetic attraction, rather than by the more common and less effective principle of mechanical filtering. Thus, particles of matter which are measured in microns (millionths of an inch), and which would pass right through an ordinary filter, are inevitably trapped by the charged metal plates of the new machine. These plates are easily removed and washed under a faucet whenever the collection of dust on them becomes too thick. In most locations, this need not be done except once every two weeks, or perhaps once a month.

The unit also is used in conference rooms and offices where smoke and stale air has long been a source of annoyance, headaches, and generally lowered efficiency of employes. The little "Micronaire" machine can be wheeled into such areas, plugged into any handy wall outlet, and put to work immediately. Request NP 356.

• • •

CHAIN SAW ATTACHMENT. The Homelite Corp. announces a new attachment that converts the Homelite Model 17 chain saw into an ***all-purpose clearing unit.***

Exclusive with Homelite, the new clearing attachment is said to be ideal



for utilities. This new clearing attachment can be operated by one man to do the work of a whole gang of men using saws and axes, it is claimed.

It eliminates stoop and squat in felling; lets you reach out to the limb without having to go underneath; takes the backache out of bucking and underbucking. Jaw-grip spike permits plunge-bucking of logs right on the ground. Spike bites into the dirt, keeps chain

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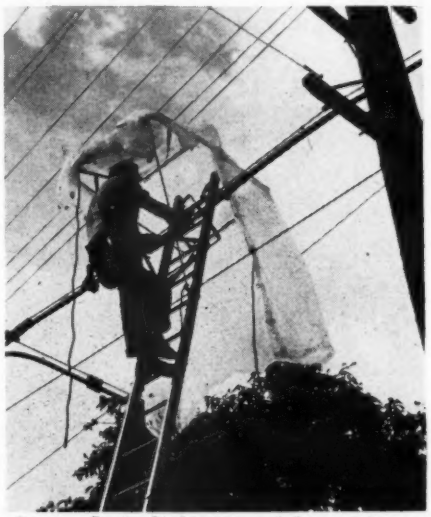
up out of the dirt; spike takes thrust of the chain, prevents logs from rolling or spinning away, the company states. Request NP 357.

• • •

ONE-MAN TENT. A new 1-man tent of translucent plastic for telephone line crews has been announced by Plastimayd Products Corp.

The new shelter was developed in close cooperation with safety super-



visors. It is light in weight, easier to handle, offers excellent protection and permits full transmission of daylight for the work at hand.

Weighing only 13 pounds, the plastic tent is easily erected or taken down by one man. It is completely waterproof, won't burn, and is impervious to deterioration from acids, oils and gasoline. All seams are electronically welded and strain points are reinforced. Brass grommets and rope loops are provided for tying down.

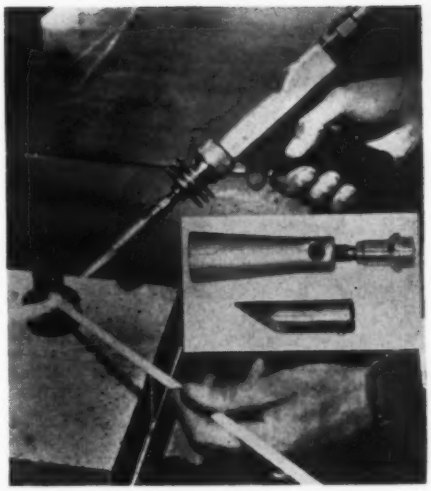
Made of specially-formulated Bakelite Krene, the tents are easily cleaned by washing with soap and water. They can be stored away wet without danger of rot or mildew.

Excellent high-voltage protection is provided by the high dielectric strength of 9,600 to 16,000 volts, depending on thickness of the material. Insulation resistance has been measured at 1.4x 10^6 megohms per cu. cm.

A larger size tent for two-man splicing crews and for covering extension ladders and "Baker" boards is also being manufactured. Request NP 358.

• • •

PORTABLE HEATING TOOL. The Fire Gun, a new, portable hand-operated heat tool that burns clean, low-cost propane with a heat range of 4,000 to 117,000 BTU per hour, is now available for small or large heating applications, according to the Fire Gun Sales Corp.



This unique trigger controlled Fire Gun is ideally suited for a multitude of heat uses, such as soldering, tinning, brazing, preheating, thawing, plasticizing and paint removal.

The 3650° F gun flame burns clean with no carbon deposit or "blackened area" because the burner tips give complete combustion of the propane using oxygen from the air.

The basic Fire Gun kit includes a heat concentrator tip, a high heat or blow torch tip, a soldering iron tip which is equivalent to a 12-pound commercial iron, hose, regulator, pressure

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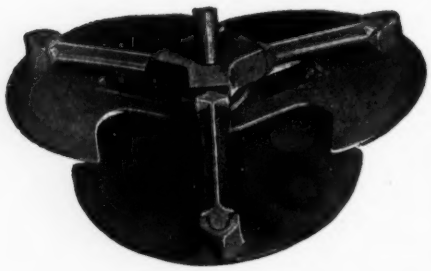

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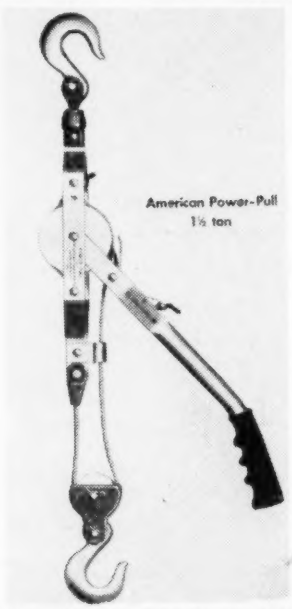

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• • •

STICKERS FOR CUT-OVERS. When "wide-range dialing" went into operation in the San Francisco area recently, The Pacific Telephone & Telegraph Co. mailed over 800,000 contact labels to subscribers to remind them of the date the new service went into effect. The "Pressure Sensitive" contact labels were designed and manufactured by The Archer Label Co. in collaboration with Pacific company's maintenance department.

"Wide-range dialing" enables San Francisco and East Bay residents to dial directly to more than 1 million tele-

This sticker tells when you begin to dial direct to 50 Bay Area communities

phones in 50 Bay Area communities, and was instituted at varying times on the many exchanges. The first group of exchanges began wide-range dialing on Aug. 1. Then each Sunday for the following five weeks another group was added.

The problem: How would each group of customers representing the various exchange groups know when to begin dialing? The solution: Small "Pressure Sensitive" contact labels, or "stickers," to be attached to the telephone by the customer himself. The labels reminded each customer when he used his phone that on the specified date, "Start Dialing Your Bay Area Calls. Give the number of this telephone when the operator asks for it."

The success of the plan was demonstrated by the smooth manner in which the changeover to "wide-range dialing" was accomplished in the Bay Area, according to executives of The Pacific Telephone & Telegraph Co. Confusion was reduced to a minimum, service was boosted materially, and subscribers were pleased with the uninterrupted service.

Selection of the proper type of contact label entailed much research and testing. The Pacific company's maintenance department insisted upon a contact label subscribers could attach and remove easily in one piece without fuss or muss, without interference or damage to telephones.

"Pressure Sensitive" contact labels were finally chosen, as they stick firmly to clean smooth surfaces without moistening and remove easily without leaving any messy adhesive on the surface. Request NP 360.

V V

General Cable Corp. Elects Four Vice Presidents

James R. MacDonald, president of General Cable Corp., announced on Dec. 21, the election of four additional vice presidents. They are: Martin H. McGrath, vice president and chief engineer; Elliott B. McGrew, vice presi-

M. H. McGRATH

dent and director of purchases; H. George Richardson, vice president and general sales manager; and August Wacker, vice president. They took over their new duties on Jan. 1, 1955. Each of the four new officers has had more than a quarter century of continuous service with General Cable.

Mr. McGrath, who had previously been chief engineer, has been engaged in engineering and technical development work for General Cable since 1924.

V V

AE Designs Special Telephones For United States Warships

A new and improved "battle wagon" telephone exchange will be one of the features of the world's largest warship, the *U.S.S. Forrestal*, recently launched at Newport News, Va.

Announcement of the 400-line, fully automatic shipboard dial telephone system, developed and built by Automatic Electric Co. of Chicago, for service with the new super carriers, has been authorized by the Navy.

Three types of specially designed telephones will be used in the system. A desk-type that can be bolted to desk tops; a bulk-head type somewhat similar to standard wall-type telephones;

Old, established, nationally known company interested in the purchase of Patents, New Products or Companies that have an application in the telephone field.
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and a new splash-proof type for use outside on weather decks.

The bulk-head and outside telephones have adjustable lighting attachments for dialing when the ship is darkened. Each instrument has locking devices to keep the handset on the hook when the ship is subjected to heavy seas or the shocks and motions of battle.

The telephones have been further perfected to give a higher degree of voice fidelity and make conversation more intelligible under conditions of excessive noise.

The system can accommodate 800 telephones on a selective, two-party line basis, equipped with a special "executive right-of-way" apparatus so that urgent or high priority communications can be cut through any existing conversation.

The structural parts of the switchboard, support brackets and cabinet enclosures, are of aluminum to cut down on weight and give the system increased shock-resisting and shatterproof qualities.

When the *U.S.S. Forrestal* is in port, shore stations may be reached from telephones on the ship through a cordless, manual switchboard, using eight shore-line trunks.

V V

Raytheon Representatives in Chicago Move to New Location

Ritter Sales Co., for over 20 years Raytheon Mfg. Co.'s representative in the Midwest telephone field, will, after Feb. 1, be at their new location, 5839 W. Montrose Ave., Chicago 34, Ill.

They were formerly at 612 N. Michigan Ave. Associated with Ralph Ritter is William Luske.

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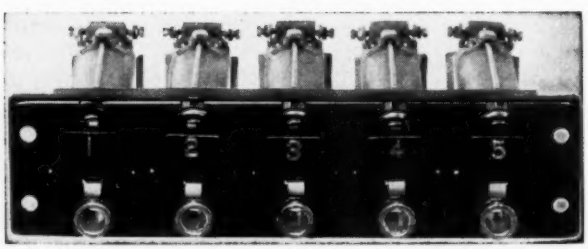

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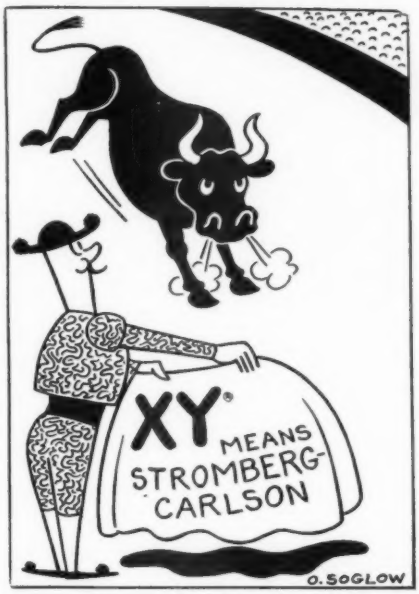

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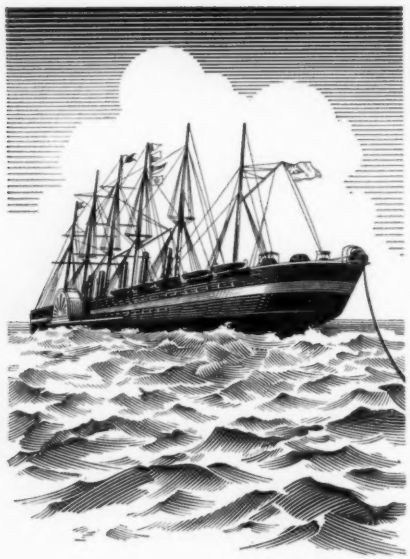

Spanning the Ocean

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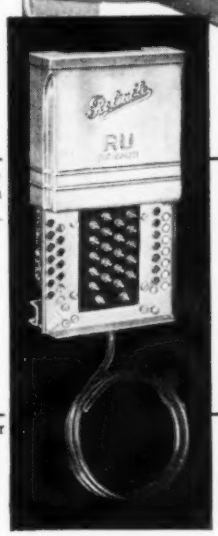

Capacity	Height Overall	Stub Data	Shipping Wt. Each Pounds
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		With 6' Stub	7
11 Pair	11"	Less Stub	4½
		With 6' Stub	7½
16 Pair	12½"	Less Stub	5
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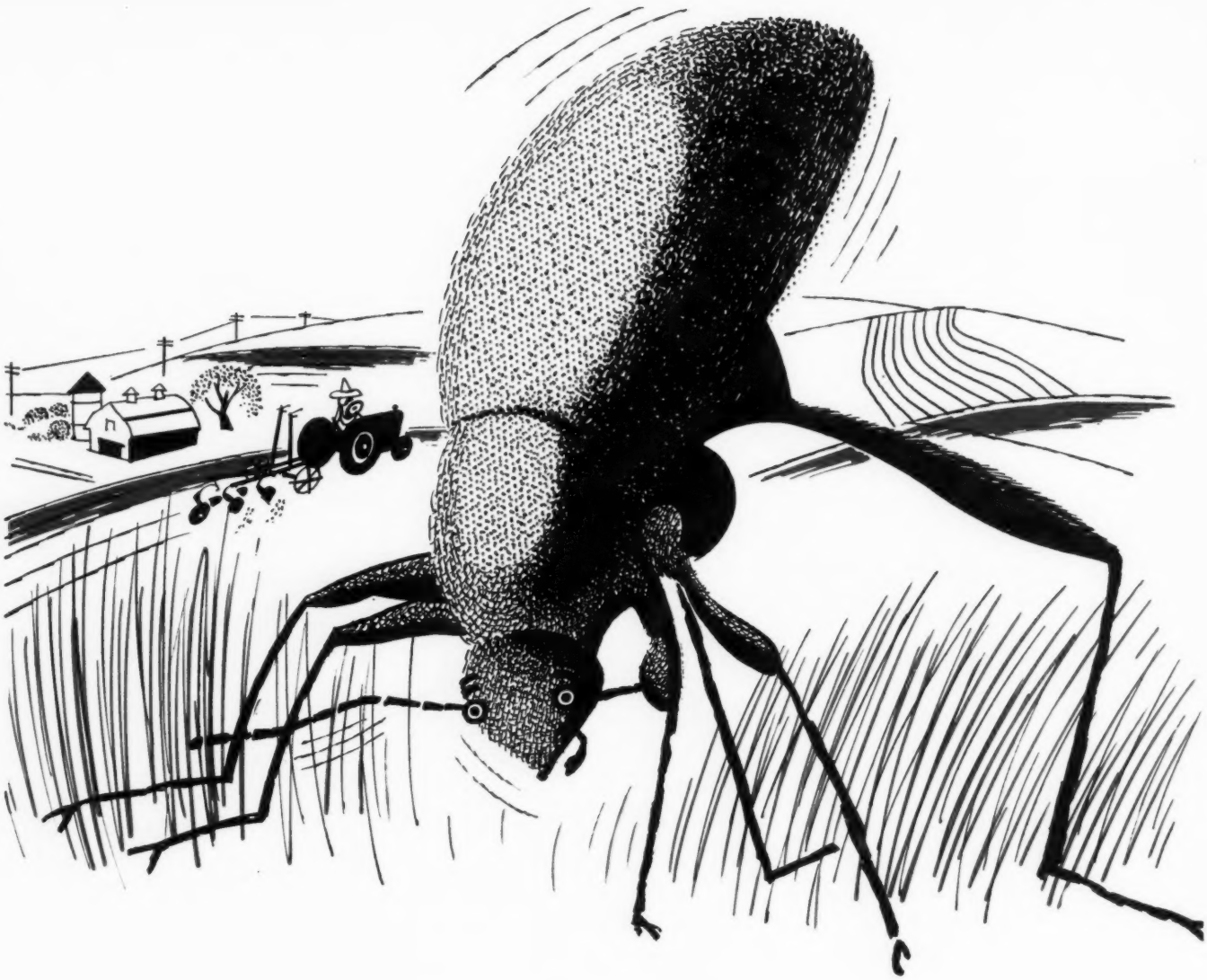

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